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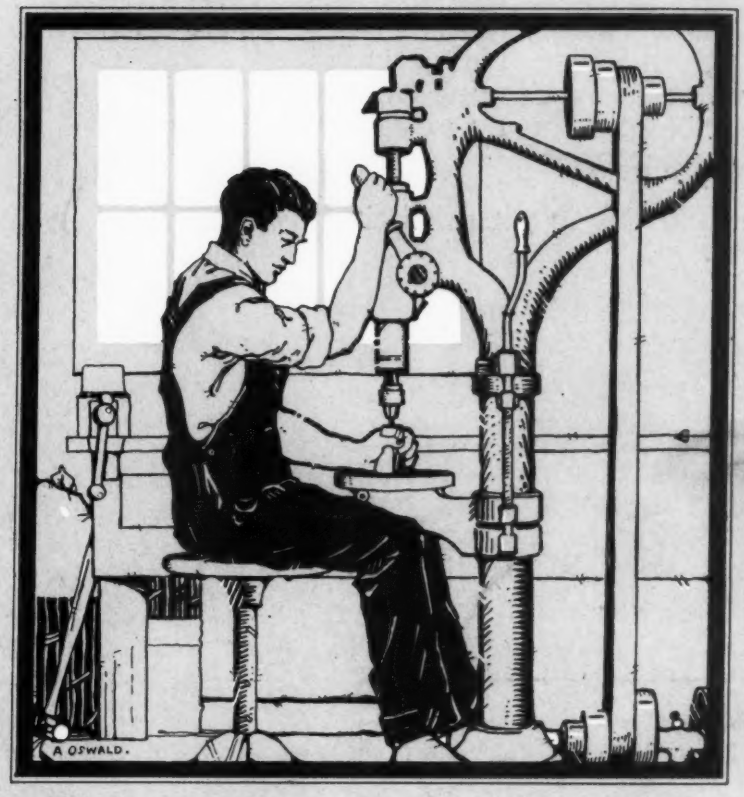

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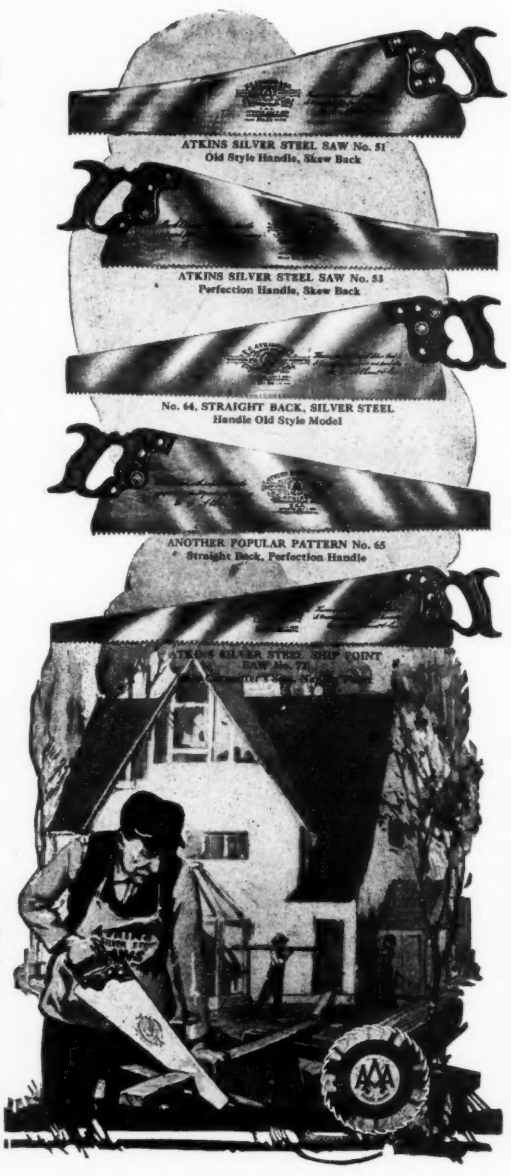
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INDUSTRIAL-ARTS MAGAZINE

Volume XIII MAY, 1924 No. 5

A Classification of the Various Aspects of Practical Education

Frank Arthur Payne, Teachers College, Columbia University.

THE average educational administrator usually has considerable difficulty in orienting himself in the field of practical education in our public schools and its cooperating agencies. There is in use in general practice a wide and confusing variety of terms; there is also a lack of clarity in regard to objectives and definiteness as to time and place of occurrence. Some of these terms are:

(1) Manual training; (2) manual arts; (3) mechanical arts; (4) industrial arts; (5) sloyd; (6) arts and crafts; (7) primary handwork; (8) prevocational work, (a) of the diagnostic type, (b) "pre" to the chosen vocation, (c) organized on the "Ettinger Plan," (d) organized on the "Russell-Bonser Plan," (e) organized on the "Gary Plan," (f) organized on the "Pittsburgh Plan;" (9) industrial education, (a) Smith-Hughes, (b) non-Smith-Hughes; (10) technical education; (11) practical arts; (12) technical arts; (13) general industrial; (14) opportunity shop; (15) the reform school shop; (16) industrial arts; (17) dull-season classes; (18) the cooperative courses; (19) all-day unit trade school; (20) part-time classes (a) trade preparatory, (b) trade extensions, (c) general continuation; (21) evening industrial classes, (a) Smith-Hughes, (b) non-Smith-Hughes; (22) vestibule school; (23) corporation school; (24) apprentice classes; (25) training departments; (26) threshold schools; (27) "In-and-outer" classes; (28) rehabilitation; (29) trade finding classes, etc.

In terms of general objectives, these 28 titles and their sub-titles, may be classified under three general heads, as shown in the acompanying chart. These general heads are as follows:

I. Practical Arts

The purpose or general objective of the practical arts is the same as that of general education. The practical arts are taught for their cultural values, for appreciation values, and for their consumer values. It is quite true that such work may be of prevocational value, or even of vocational value to certain individuals. In such cases the prevocational and vocational values, are not evident until the course or courses, are completed, and the later situation, in which the individual finds himself, develops a need for these practical arts courses.

Under these general objectives, as established, we find manual training, manual arts, industrial arts, sloyd, the part-time general continuation shopwork, primary handwork, arts, and crafts.

II. Prevocational

In general the meaning of this term is that the work is "pre" to other more definite courses that prepare for the vocation. On analysis, however, we find that this field may be classified as:

(a) Work given for its diagnostic values, for self-discovery, exploration, vocational and educational guidance;

(b) That which is more strictly "pre" to entrance to the vocation. The four methods of organization of prevocational work are:

(1) *The Ettinger Plan* (Supt. Ettinger of New York City), in which the individual student is routed through a series of specialized shops for periods varying from six to twelve weeks;

(2) *The Russell-Bonser Plan* (Dean Russell, Dr. Bonser, Columbia University) in which a student is given a wide variety of experiences, with industrial materials, tools, and processes in a general industrial shop;

(3) *The Gary Plan* (Gary Plan, Indiana) where the student gets his industrial experiences working on productive work, under the direction of an experienced tradesman;

(4) *The Pittsburgh Plan* (Pittsburgh, Pa.) in which the student spends the first year in a general shop (Bonser Plan), the second year in a series of special shops (Ettinger Plan), and the third year spends all of the shop time in one special shop which he has chosen, "pre" to entrance upon the vocation.

Prevocational work is usually found almost exclusively in the junior high schools. In our senior high schools, however, we find considerable work, such as work in the mechanic arts, technical arts, technical education, which is really "pre" or preparatory to entrance to university engineering courses. These are paralleled

by other "pre" courses in other fields such as pre-medical courses, pre-law courses, pre-dentistry courses, pre-business courses, etc.

We have under *prevocational:* (1) Mechanic Arts; (2) Technical Education; (3) Technical Arts; (4) Arts and Crafts.

III. Vocational Industrial Education

The accepted objective of this formal vocational education is "to fit for useful employment" in the trades and industries. Distinction must be made here between vocational industrial education, and vocational industrial training, terms that are often used interchangeably by many people. Vocational *education* means, as developed before the passage of, and standardized by the Smith-Hughes Law, education in the following phases of any occupation:

(a) Necessary skills;

(b) Related knowledge;

(c) Social understanding of the relations and importance of this occupation.

In other words, vocational education truly educates, and is not limited to the acquirement of manipulative skills. It has a dual purpose, training for effective service, and the development of the capacities and powers of the individual as a unit in society.

As shown in the chart under this heading, we find (1) trade education, (2) apprentice schools, (3) corporation schools, (4) arts and crafts, (5) dull-season classes, (6) in-and-outer classes, (7) foremanship classes, (8) rehabilitation, (9) part-time trade extension and trade preparatory classes, (10) evening industrial classes, (11) industrial education, (12) mining education.

IV. Vocational Industrial Training

The primary purpose of this form of vocational training is training for production, with the development of the individual taking a secondary place. When using this term it must be admitted that there can be no training without education, but the term is used in terms of the more definite objective. Vocational training is conceived to be training exclusively in the necessary skills and manipulation of tools, materials, and processes, for the purposes of increased production.

As shown in the chart, we have under this heading, corporation schools, vestibule schools, threshold schools, training departments, rehabilitation classes.

It will be noticed in the chart that occasionally one term appears in more than one group. For instance, arts and crafts work, which has a large measure of practical arts values, also a large measure of prevocational values, and may quite well have a considerable measure of vocational industrial education values, but is excluded from the vocational training because that is limited exclusively to the acquirement of skills.

VARIOUS ASPECTS OF PRACTICAL EDUCATION CLASSIFIED AND CHARTED

I. PRACTICAL ARTS EDUCATION

Objectives:

General Education; appreciation values; educational values; consumer values; cultural values.

A. Industrial

1. Manual Training—Sixth grade through high school
2. Manual Arts—First grade through high school
3. Industrial Arts—Russell-Bonser Plan; first grade through high school
4. Sloyd—First grade through eighth grade
5. Primary Hand Work—First grade through third grade
6. Arts and Crafts—High school
7. Part-Time Classes—General continuation; 14-16-18 years of age.

B. Non-Industrial

8. Agricultural Arts—Sixth grade through high school
9. Commercial Arts—Sixth grade through high school
10. Household Arts—Sixth grade through high school

II. PREVOCATIONAL EDUCATION

Objectives:

a. Diagnostic; self-discovery; exploration; guidance
b. Diversified vocational experiences "pre" to entrance upon a vocational education course

A. Industrial

1. Industrial Arts—
   a. Russell-Bonser Plan; junior high school and senior high school
   b. Ettinger Plan; junior high school
   c. Gary Plan; junior and senior high school
   d. Pittsburgh Combination Plan; Junior high school
2. Mechanic Arts—High school
3. Technical Arts—High school
4. Arts and Crafts—Sixth grade through high school

B. Non-Industrial

5. Agricultural Arts—Sixth grade through high school
6. Commercial Arts—Seventh grade through high school
7. Household Arts—Sixth grade through high school

III. VOCATIONAL EDUCATION

Objectives:

"To fit for useful employment." Broad education in three divisions of the vocation
a. Skills—things one must be able to do well in order to succeed in the vocation
b. Related knowledge—things we must know in order to succeed in the vocation
c. Social and economic relationships

A. Industrial

1. Trade Education—14 years of age and upwards, for specific trade
2. Industrial Education—14 years of age and upwards for trade or industry
3. Apprentice Classes—14 to 21 years of age
4. Foremanship—Adult
5. Part-time Classes—
   a. Trade Extension
   b. Trade Preparatory. 14 years of age and upwards
6. Evening Classes—
   a. Trade Extension (Smith-Hughes)
   b. Trade Preparatory (non Smith-Hughes)
7. Rehabilitation—Adult: Civil; Military
8. Dull Season Classes—14 years of age and upwards
9. "In and Outer" Classes—14 years of age and upwards
10. Corporation Schools (certain types)—14 years of age and upwards
11. Mining Education—Adult
12. Arts and Crafts—High schools

B. Non-Industrial

13. Agricultural Education—14 years of age and upwards
14. Commercial Education—14 years of age and upwards
15. Professional Education—18 years of age and upwards (some are industrial)
16. Transportation Education—16 years of age and upwards (some phases are classified as industrial)

17. Personal and Domestic Service Education—14 years of age and upwards
18. Public Service Education—20 years of age and upwards

IV. VOCATIONAL TRAINING

Skill training for any specialized occupation in any of the vocations.

Objective:

"To fit for useful employment." Training in one division of a vocation, i. e., skills; narrow training primarily for production. Development of the individual is secondary. Not found in the public schools

1. Vestibule Schools—
   Age, Child Labor Law minimums upwards. Training for entrance to specialized occupation
2. Threshold Schools—
   Same as Vestibule Schools
3. Training Departments—
   Age: Child Labor law minimums upwards. Training for entrance; for alternate occupations; for "upgrading" and promotion
4. Rehabilitation—
   Smith-Sears Law; Military, Smith-Bankhead Law; Civil.

Industrial Arts Sketching — Part II[1]

PRINCIPLES OF SHAPE DESCRIPTION

Carl L. Svensen.

AFTER the necessary skill in handling the pencil has been acquired by careful practice, sketching becomes a quick and convenient means of representation — of making ideas visible. Sketching as applied to industrial representations and for the development of industrial thought forms one of the most important divisions of the graphic language. As stated before, accurate proportions and "clean cut" lines are fundamentals of good sketches.

There are many ways in which sketching may be applied to the development and representation of industrial products, constructions, etc. (Fig. 1). Perspective shows how the object looks but does not tell the exact shape and proportions. Isometric, oblique, and other one-view methods are often convenient but are not sufficiently definite for most industrial purposes.

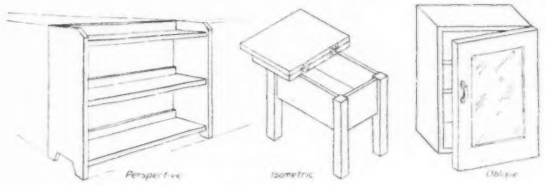

FIG. 1.

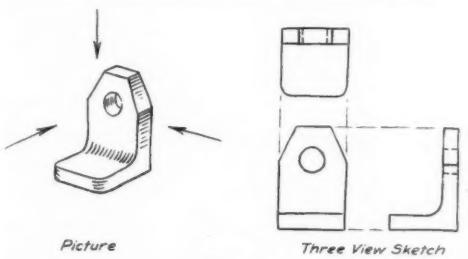

FIG. 2.

In Fig. 2, each view of the three-view sketch gives exact information and the three views together give a complete description of the shape of the object. The views must be properly arranged to accomplish this purpose. Observe that the front and side views are included between parallel horizontal lines. The front and top views are included between parallel vertical lines. Each is viewed from a different position in order that the true shape of all parts may be seen.

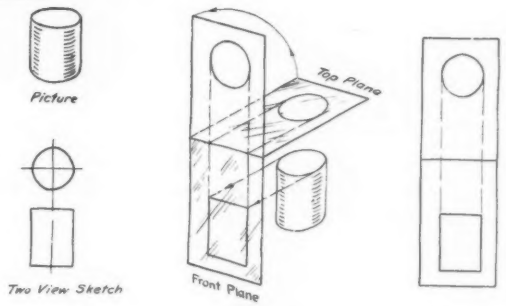

FIG. 3.

A study of Fig. 3 will indicate the method of obtaining and placing views. In the picture, the cylinder appears elliptical while the top view of the sketch shows that it is actually circular. The front view shows the height of the cylinder and its diameter. This is a two-view sketch. The views are obtained by the use of two imaginery glass planes placed at right angles to each other, with the cylinder in the position shown. By placing a pencil against the front plane, and moving it so that it is always directly in front of a point on the cylinder, a view may be drawn showing the height and diameter. In the same way the top view may be drawn on the top plane. This top plane is then revolved or turned up as indicated.

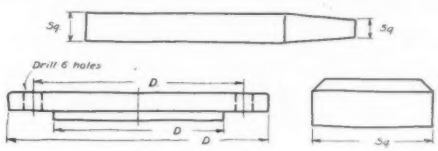

FIG. 4.

The addition of a note to a sketch often makes it possible to use one view as in Fig. 4. For all practical purposes this is just as good as more views and saves the time required to sketch the extra view.

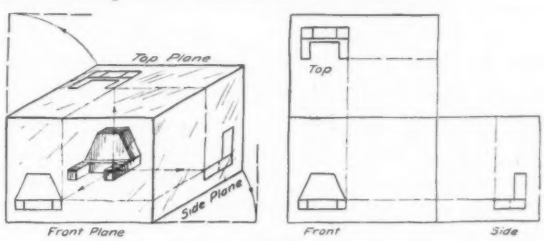

FIG. 5.

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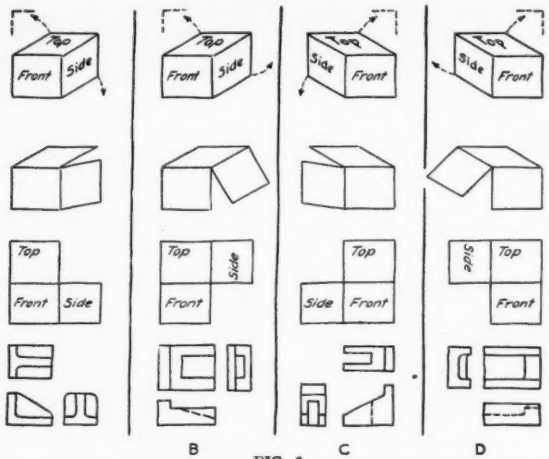


FIG. 6.

Three views are necessary to describe the piece shown in Fig. 5. In this case three planes are used, at right angles to each other like the corner of a box. The lines drawn from the object perpendicular to the planes are called projection lines. The views are obtained by projecting to the three planes. The planes are then opened up so that the views will all be in a single plane. This makes it possible for a sheet of paper to be used to sketch an exact graphic description of a material form. The arrangement of views as explained should be thoroughly understood and a number of practice sketches made.

Sometimes, however, the space available or the shape of the object is such that a different choice of views is desirable. In Fig. 6, some other positions are shown. It will be observed that these positions are obtained by opening the planes in different ways, or by using a left-side plane instead of a right-side plane.

In order to simplify the reading of a sketch, different kinds of lines are used for different purposes. A full-weight line is used to show the outline of a view and all the visible edges.

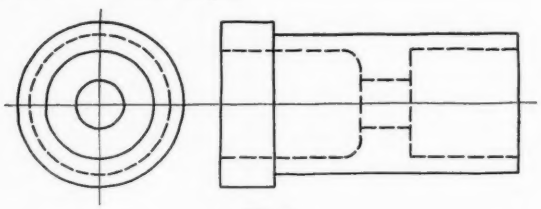


FIG. 7.

A "dotted" or "short dash" line is used to represent invisible edges, those which are hidden behind some part of the object, Fig. 7.

On sketches, dotted lines are first drawn as *very light* full lines and then the dots or dashes are made over the full lines. This not only gives a neater sketch but saves time. Note the dots touching at the corners and the treatment of arcs.

Center lines are used to locate cylindrical parts and as an axis of symmetry, etc., are drawn as very fine, light, full lines, on sketches.

When it is difficult to understand the interior construction of an object from a study of exterior views, we may imagine the object to be cut by a plane and a part removed as in Fig. 8. The full lines beyond the plane of the section are shown. Sometimes dotted lines can be omitted, especially if they are unnecessary for an understanding of the views or tend to confuse them. The cut surface is represented by a series of parallel lines drawn lightly as shown.

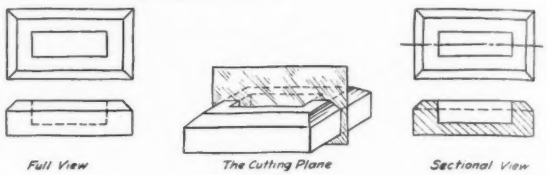


FIG. 8.

When a part of an object is at an angle, it may be shown on a special or auxiliary plane as in Fig. 9. Very often only partial views are shown, just enough to help out the regular views. The regular views may often be incomplete in such cases.

The general procedure in making a sketch is to examine the object (actual or mental), determine the number of views necessary to describe its shape completely, and observe the proportions. Then proceed to sketch very lightly, locating the center and principal lines, and block in the limits for all views, Fig. 10. Sketch the details and then go over and brighten up

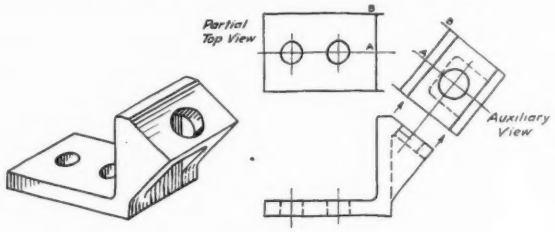


FIG. 9.

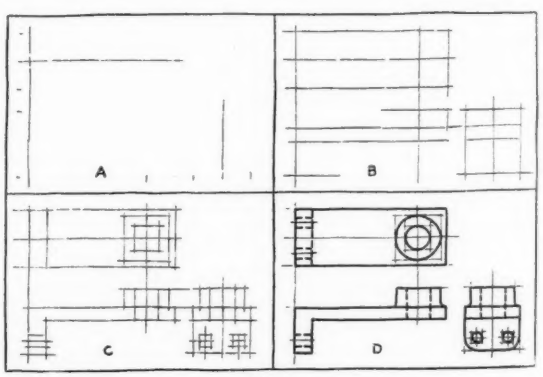


FIG. 10.

wherever necessary in order to make all parts clear and definite. *All views should be blocked in completely with straight lines, regardless of the number of curves, circle arcs, etc.* This is shown in stages in Fig. 10.

It is very necessary that the views and parts of views be correctly proportioned. This is particularly true of

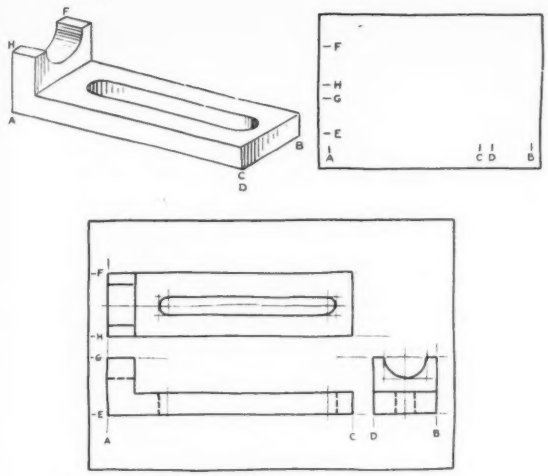


FIG. 11.

idea and design sketches. There are several ways of securing proportion. Distances may be estimated in inches and lines drawn on the sketch to agree with the estimated lengths. Squared paper may be used to sketch "to scale." When size makes it convenient, the sketch may be made about one-half or one-fourth size, estimating the distances, of course.

The general method which follows, can always be used and is to be preferred. This method will help to develop one's ability to estimate well, to think accurately and to work quickly. In addition it facilitates making the views as large as the available space permits. Briefly, this method consists of estimating the general proportions and then selecting a part of the object as a unit from which to proportion the views. The details are sketched by observing the proportions of one part to another.

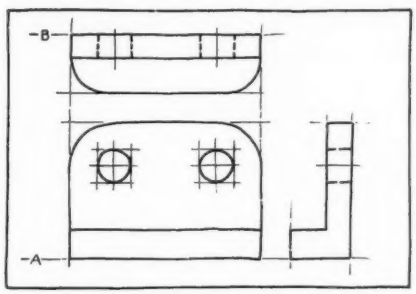


FIG. 12.

For a piece such as Fig. 11, the size of the views is determined by the total length of the front and end views. To start the sketch make short marks at A and B as near the limits of the sheet as desired. This will fix the size of all views and their proportions. Then note that the width of the piece is about one-fourth of its length and make short marks at C and D adjusting their positions until distance DB appears to be about one-fourth distance AC. The distance CD can be whatever is convenient depending upon whether the sketch is to be dimensioned or not.

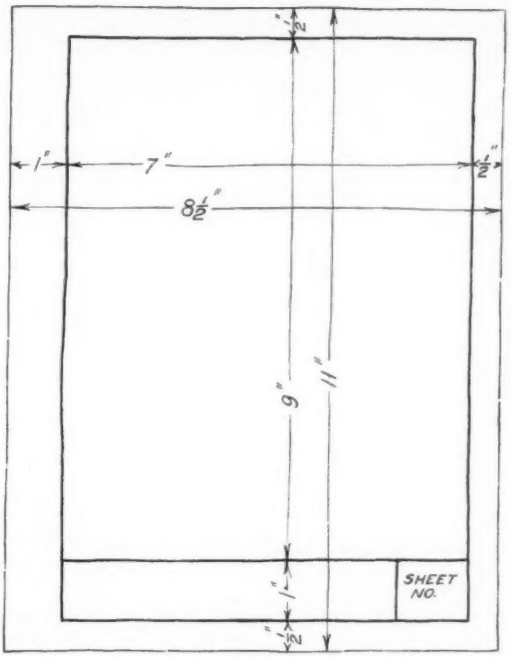


FIG. 13.

Next fix the distances EG and FH using the distance DB as a unit to fix the proportions. The views can now be blocked in and the details proportioned from the same unit and each other.

Note that in this case there is more room at the top and bottom of the working space than at the ends. This is because a rectangle which would just contain the three views taken together is longer in proportion to height than the working space available.

For a piece such as Fig. 12, the size of views is determined by the width of the top view plus the height of the front view. In this case there is more space at the ends, as the three views together are nearer square than the available space. The detail procedure after fixing points A and B is similar to that described for the previous object.

The size of views must be large enough to show details clearly and to take care of the dimensions and notes. The usual mistake is to make the views too small. Do not try to crowd three views of a large or intricate construction on a single sheet. Use one or more sheets for a single view if necessary. Often half

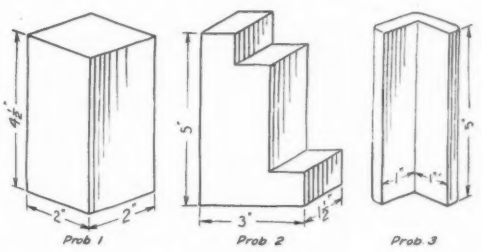


FIG. 14.

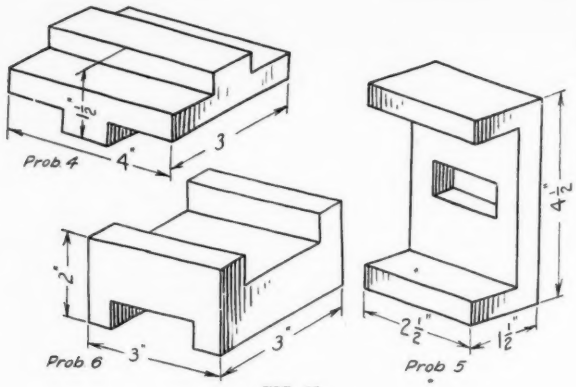


FIG. 15.

a view will serve, and so can be sketched larger than a full view.

Whatever treatment may be applied to the representation of a piece of furniture, a machine, a detail of a building, or any other material form, the purpose of the sketch which is to describe shape, should be kept clearly in mind.

This presentation of the method of obtaining the views is a preparation for the practical application of the graphic language to industrial uses. The prin-

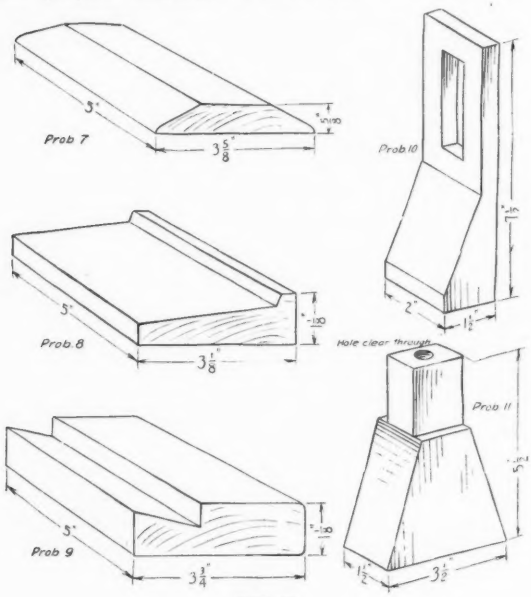


FIG. 16.

ciples are the same whether the sketch is made from an actual object or from a mental image of something which does not yet exist.

Sketching Exercises

The exercises suggested for sketching practice may be conveniently worked on 8½"x11" plain paper either white or cream. A border line and title space are desirable and may be drawn with instruments or freehand, Fig. 13. If freehand, estimate the distances which are indicated on the layout.

Most of the pictures have a few "over all" dimensions. These are for the purpose of assisting the reader in judging the proportions of the object. Where a sheet lay-out is given the working space represents a rectangle 7"x9".

Probs. 1, 2, 3, Fig. 14. Sketch three views of the PLAIN BLOCK, the STEPPED BLOCK, and the CORNER BEAD.

Probs. 4, 5, 6, Fig. 15. Sketch three views of the CROSS BLOCK, the U-WASHER, and the DOUBLE GUIDE.

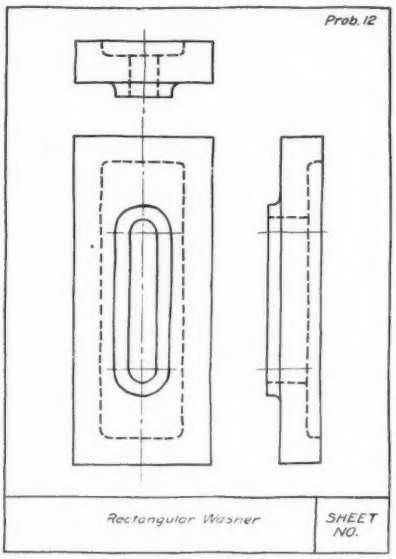


FIG. 17.

Probs. 7, 8, 9, Fig. 16. Sketch two views of the pieces of THRESHOLD, DRIP CAP, and WINDOW STOOL.

Probs. 10 and 11, Fig. 16. Sketch the necessary views of the SINGLE WEDGE and the DOUBLE WEDGE.

Prob. 12, Fig. 17. Sketch three views of the RECTANGULAR WASHER. Show right hand view as a section.

Prob. 13, Fig. 18. Sketch three views of the ADJUSTING BOX. Show lower view as a section.

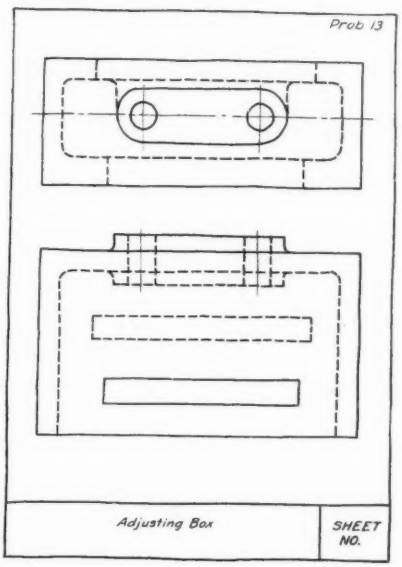


FIG. 18.

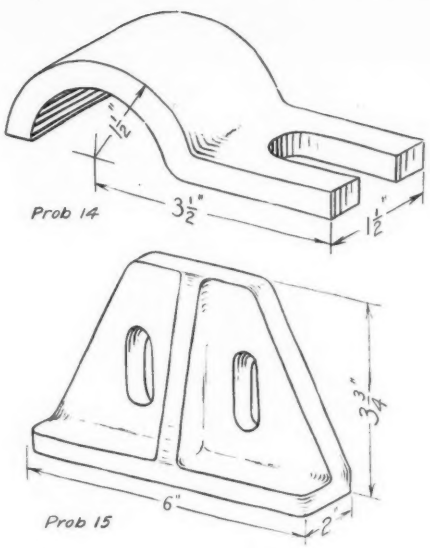


FIG. 19.

Probs. 14 and 15, Fig. 19. Sketch the necessary views of the WROUGHT IRON CLAMP and the ADJUSTABLE LUG.

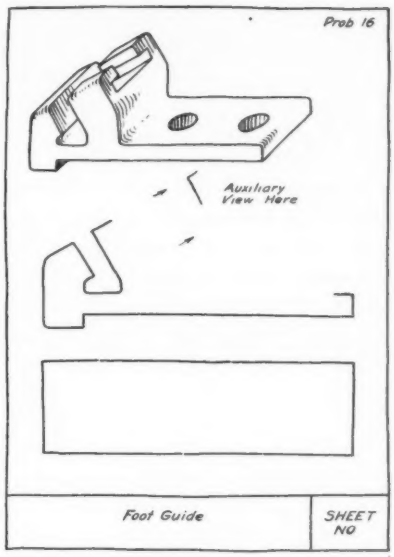


FIG. 20.

Prob. 16, Fig. 20. Sketch a complete side view of the FOOT GUIDE. Sketch enough of the bottom view and of the auxiliary view to finish the description of the piece. Do not copy the picture.

Some Definite Objectives in Manual Arts[1]

Howard L. Briggs, Director, Department of Industrial Education, Cleveland, Ohio.

IN defining definite objectives for industrial arts in the junior high school, we must first determine the objectives of the junior high school itself.

Briggs in his "Junior High Schools" gives the following objectives:

(1) To continue, insofar as it seems wise and possible, and to a gradually diminishing degree, a common integrating education.

(2) To ascertain and reasonably satisfy the pupil's important and assured future needs.

(3) To explore by means of material within itself worth while the interests, aptitudes and capacities of the pupils.

(4) To reveal through the means of material in itself worth while the possibilities of the major fields of learning.

(5) To start each pupil upon the career which, as a result of the exploratory courses, he, his parents, and the school are convinced is the most likely to be of profit to him and the state.

It is upon this foundation that I have built up the following objectives, covering the teaching of industrial arts during the high school period.

I do not believe that we can state the general objectives of an entire junior high school period. I would rather divide the work into years, enumerating a general objective for each year. It should be recognized that all of these objectives overlap into succeeding years and that the entire problem of junior high school education is a gradual transition from the elementary school environment to the senior high school and the job.

The first year I would designate as a *transitional* year. It is the period during which the child makes his first contacts with the new school organization, with new teachers, with new ideals and objectives. His entrance has been preceded by education in the key subjects. He is now ready to unlock the doors of a higher learning. He is entering a new field of exploration. He is still a child. We must appeal, in our shopwork, to play incentives of adolescent interests. We must base this work upon his past experiences, his present needs and his immediate interests. The child is living through a period of imitation; he desires to do things as the grown-ups do; he desires to have some practical application of the projects made in the shop; but it is a period of fleeting interests and the projects must therefore be of short duration. I recommend for the transitional period, short, intensive projects having immediate applications to the home and to the school. They should offer the greatest possible variety of experiences in materials and operations, with projects sufficiently simplified to enable the pupil to complete them in a finished and workmanlike manner in a minimum amount of time. I would encourage the boy to apply the knowledge thus obtained through home applications to practical ends. I would gradually guide him

[1]Abstract of a paper read before the Industrial Arts Section of the Ohio State Teachers' Association at Columbus, December, 1923.

through the seventh year to an *overview* course in the eighth year.

I would, through the medium of vocational information draw his interest from classroom studies to the possibilities of placements and requirements of the various fields of vocational endeavor. If the boy is to go on to high school and prepare for medicine, he should be familiar with the nature of the subjects taken throughout a college course leading to an M.D. degree. If he is to leave school at the end of the junior high school period, he should know the types of jobs open to him at that time and should be familiar with his own aptitudes and interests carefully analyzed through experiences in the various school subjects. He should not be influenced by the personality of any one shop teacher.

With this ideal in view, from the seventh B grade up, I would rotate him for definite periods through all available shop subjects as well as through a wide field of classroom endeavor in the commercial subjects, etc. This should be done not with the idea of teaching him but rather of enabling him through the school laboratory, to determine his own reactions to the stimuli of shop jobs completed in a workmanlike way, under conditions as nearly as possible like those offered in the various fields of industry.

For the boy going on to college this training is cultural in the broadest sense of the word, as it familiarizes him with fundamental materials and shop operations in a variety of industrial fields. It gives him the ability to appreciate good workmanship; it gives him a foundation for avocational interests, should be enter the professions.

For the boy leaving school immediately, there is a large possibility of transfer through practical applications of the operations that he has mastered while passing through these various shops.

The ninth year, I would designate as a *prevocational* year. The boy should be allowed to specialize in one or two definite shops or subjects in fields in which he finds himself best adapted. It is not our objective at this time to teach the boy any specific trade but rather to enable him to receive a training preceding actual specific vocational preparation through a closer application to a more narrowed field. Personally, I do not favor elections preceding the ninth grade. The course should be an integrating one rather than a disintegrating proposition up to that point. The boy is too young to learn a trade as no skilled industry will accept a worker previous to 17 years of age. The types of jobs available to a boy of lesser years are the "iron man" operation type of job in which there is a rapid turnover. The boy is best equipped for jobs of this nature by a training covering the simpler operations in a variety of fields rather than intensive trade-preparatory training.

Trade training should be conducted in a separate school for those who are graduated from the junior high schools, having completed prevocational courses, and being of one or two years' duration, merging the child into a part-time group as soon as possible in order that he may receive part of his training in the actual environment in which he will work, enabling the school to turn the child out at an age when he may receive employment in the field for which he has prepared.

For the pupil of low mentality, we should have a school training the boy horizontally over a variety of elementary operations in a large variety of "iron man" jobs.

For the boy already in the trade, we should provide for his needs through part-time classes, offering trade extension courses.

For a boy of good mentality, definitely proving a desire to enter into trade-preparatory work, we should enable him to make the transition from the junior high school to the trade school at an earlier period. I do not believe it good economy to equip the junior high school with large shops, aiming at intensive training for specific trades. It is much better economy to centralize this equipment in a trade school.

In Cleveland we are equipping our schools with general metal shops, general wood shops, general print shops and drafting rooms. The fundamental operations involved in a number of metal trades may be adequately covered in a general metal shop properly equipped at a minimum expenditure.

I believe that we should definitely distinguish between vocational objectives and industrial-arts objectives. Both have a place, one gradually merging into the other in many cases. There is no conflict between the ideals of the industrial advocates and the vocational advocates, but I do not favor a mixture of the two fields of education through which neither job is efficiently or effectively carried out.

Industrial arts, nationally named "cultural," furnish a need for guidance and interpretations of individual capacities and interests and are prevocational in nature.

Every system should offer an adequate vocational program as a follow-up of the large bulk of students entering into industrial employment at an early age.

The senior high schools are paid for from state and local taxes, so also are the universities. Both are vocational in nature, as they are the finishing schools for many students. The boy leaving school at an earlier age certainly is entitled to preparation for his life vocation, to the same extent that an expenditure is made for preparing a boy or girl entering a profession.

NOT ALL ARE CHOSEN

We have elementary schools, high schools, and colleges, always ascending. But it is absurd to believe that every individual who enters elementary schools is fitted to advance to a higher state of education or to a professional life. We have got to lose some of them on the way. That is not theory, but a fact. However, most parents believe that there is an amendment to the Constitution which provides their sons or daughters with the privilege of a college education.—President Little, University of Maine.

The Imposition of Book Forms

Robert F. Salade.

(Concluded from April.)

AMONG the most important work in the composing room of a large printing or publishing house is the imposition of book forms. And, in speaking here of "book forms," we refer to all classes of bookwork, including catalogs, house-organs, trade journals, booklets and pamphlets. Imposition work of this magnitude can only be done by first-class imposition men who have had years of experience at it, and it is safe to say that an expert man in this line is always sure of holding a steady position at a higher rate of wages than are paid to the average compositor.

Those who are not familiar with the work relating to the imposition of large book forms will fully realize the importance of this work by visiting a big composing room where it is done. Large forms for catalogs, house-organs, booklets, etc., must be made up to very accurate measurements, to allow for binding margins and trims, and to make pages register nicely when the sheets are "backed up." The most intricate work of all in this line applies to forms for color printing. Here nothing may be taken for granted—everything must be scientifically correct. Trained imposition men are capable of making up an exceedingly large form for color printing in such an efficient manner that few "shifts" and changes will be essential after the form has been put on the press.

In these days a great variety of bookwork, advertising literature, process-color work and regular color work calls for the use of electrotype plates, and in many cases these plates are laid upon patented base by the imposition men. In other cases the plates are mounted on the regular wood base, to be made up and locked up in the same way as pages of type. There are several well-known makes of patented base in use including sectional steel blocks, self-contained steel base to fit the bed of a cylinder press, upright-grain sectional blocks, self-contained all wood upright-grain tacking base, and self-contained metal bound upright-grain tacking base. There are also a number of special plate-mounting systems (of steel) which are adjustable to take all sizes of electrotypes. Space will not permit a detailed description of all the standard makes of patented base here.

We should not overlook the fact that there will always be numerous forms set up in foundry type, rules, borders, etc., to be imposed, despite the tremendous increase of machine composition. The forms of foundry type include pages of text matter for fine books, pages of display advertising for magazines and trade journals, and pages of both type and halftone plates for booklets, catalogs, and so forth. On the other hand, the greater number of book pages, catalog pages, trade-journal pages, etc., now being imposed are of machine composition. In many instances of big-edition bookwork, machine composition is so comparatively economical that it is practicable to print directly from the pages of type, instead of having electrotypes made from the pages. In the cases here referred to, the wear and tear on the pages of machine composition does not matter, as the pages are to be cast into the melting pot after the long run has been completed.

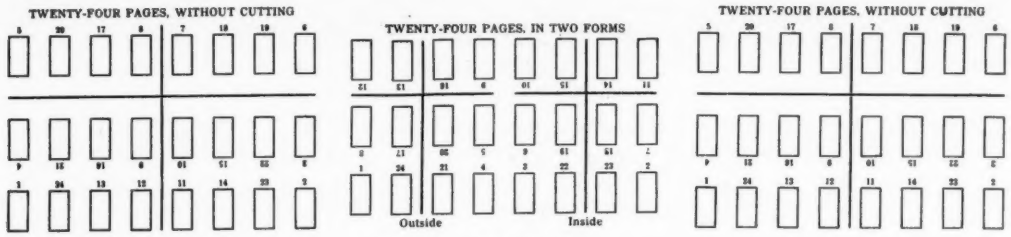
We can understand, then, that the modern imposition man will be called upon to handle not only pages of foundry type, but pages of machine composition and unmounted electrotypes of pages as well. Stereotypes of book pages are no longer being used to any extent, on account of the excellent quality of electrotypes, therefore we shall not consider stereotype plates here. And, while it is true that all electrotypes should be mounted on a solid base, (which may consist of anything from solid lead to steel or upright-grain blocks), to obtain the best results in press work, yet large numbers of electrotypes will always be commonly blocked, and the imposition man will have to care for such plates in the usual way as they come along. Untold numbers of original halftones and zinc etchings are also mounted on ordinary wood base.

The equipment of many large composing rooms includes a type-high planing machine, or perhaps a combination shuteboard and type-high machine. The latter is the best device for not only squaring the sides of a wood-base plate but for making the plate type-high as well. In a plant having either one of these machines it is usually the practice for the imposition men to utilize the machine and make all blocked plates type-high (.918 inch) before they are locked up for press. Even in cases where pages of type matter incorporate numerous halftones, zinc etchings or electrotypes, the well-trained imposition man will see to it that all of the plates are made type-high. Blocked plates that are lower than type-high are raised to the proper height by means of cardboard and paper glued to their bottoms.

No imposition man should be without a combination type-high, base and plate gauge—a handy little tool that can be carried in one's pocket. This combination gauge tells at a glance the correct height of type or press bearers, the standard thickness of unmounted zinc, halftone and electrotype plates, and also the two standard heights of base for these unmounted plates.

Every imposition man should also have a good-size "L" square, to be used in squaring up forms, squaring the positions of plates, and similar work. A large "T" square is another exceedingly useful tool for an imposition man working on book forms. On many occasions a "T" square can be used as a straightedge for lining up forms of pages.

In many large printing and publishing plants the work of "lining up" forms of book pages has been



TYPICAL 24-PAGE FORMS.

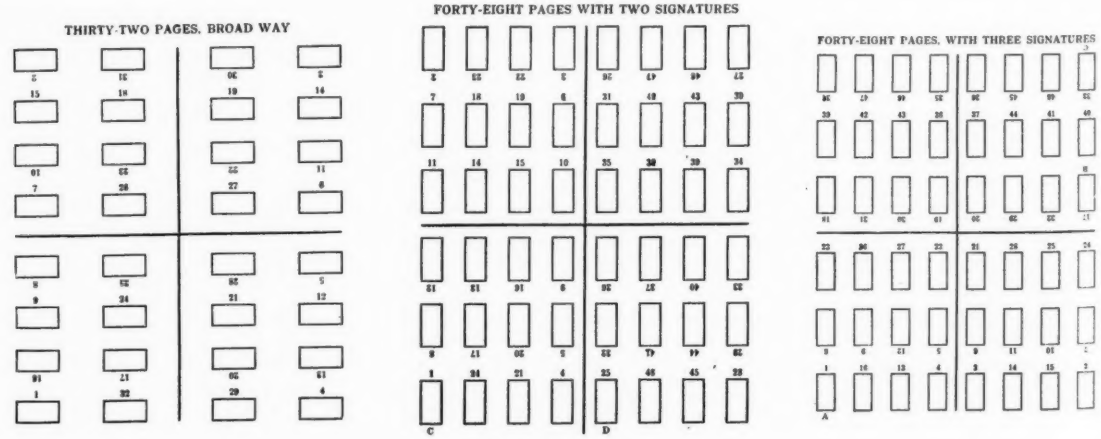
brought down to an exact science, but to make this possible it is necessary to make use of special equipment and devices. For example, the equipment of numerous composing rooms now includes a patented device of steel having a sliding straightedge and adjustable cross-fingers. This device can be placed on a 32-page book-form and so adjusted as to line-up and square the head, front and back margins all at the one operation. This same device can also be used for lining-up plates attached to patented base of any kind, or for lining-up forms of many sizes, as to number of pages and style of make-up.

The modern register table is a great convenience and time-saver in registering forms of color printing as well as black forms of pages to be "backed up." The top of the register table is of heavy plate glass which covers a light compartment. This compartment is finished in white enamel, and the light reflectors at the bottom are turned upward to throw a strong, white light against the under side of the plate-glass top. The printed sheet is placed on the glass top and becomes translucent when the light is turned on, showing plainly the positions of the plates, rules, lines of type, or pages which are to be registered. With pencil and a long straightedge the "O.K." man lines up the sheet as to the desired register, and marks down instructions for essential changes in the imposition of the form in question. When a register table is installed in a well-lighted room, a canopy of black fabric should be hung over it to form sort of a "dark room" that will enable the lights in the table to perform their function to the greatest advantage.

The "line-up table" in several large composing rooms consists of a spacious draughtsman's table with a drawing board that can be tilted to any desired angle. Across the drawing board is a long steel measuring gauge, or straightedge, which can be moved and set to many different points for the most accurate line-up work. The printed sheet is laid upon this board, and then the "O.K." man carefully rules the sheets with pencil and the measuring gauge to determine the correct positions of pages. The penciled lines will indicate any changes in the imposition of the form which may be necessary.

When about to impose a book form the imposition man will save a great deal of time by ascertaining what widths and lengths of furniture will be required for the margins, and then assembling the furniture and placing it in systematic order on the imposing table ready for use. After a book form has been locked up, the line-up of the pages should be tested with a regular straightedge, a "T" square, or a patented lining up device like the one that already has been referred to. The squareness of each page should also be tested with an "L" square. All necessary corrections or changes in the make-up and imposition should be made before the form is sent to the pressroom. Slight twists and bends in a large form of book pages may be easily corrected by loosening the quoins on one side and tightening those on the opposite side of the cross-bar.

The tests for correct imposition of book pages are comparatively simple: As a general rule, the ordinary style of book form is imposed from the center, the lowest (first) folio of the form placed at the lower left-



32 and 48-PAGE FORMS.

hand corner of the form. All odd folios are at the left-hand of the form as viewed from the foot. By the law of mathematics, the odd and even folios of pages laid side-by side in a correctly imposed form, will, when added together, give a total of one more than the number of pages in a signature. The first and last pages of a signature are always placed side-by-side, as for example, in a 32-page form where the folios 1 and 32 equal 33.

It will be necessary for the imposition man working on book forms to know the gripper margins of all cylinder presses in the plant. A gauge showing the gripper margin of each press should be obtained from the pressman, and should be kept in a convenient place for use when needed. As applied to book forms, the space between the type and the outer edge of the chase, at the gripper side, is the gripper margin. When the sheet of paper is placed in its right position on the form of pages, the distance between the edge of the paper and the edge of the chase should be at least three-quarters of an inch less than the gripper margin to allow the pressman space to move the form into a suitable place on the bed of the press. To make the proper allowance for gripper margin it is frequently necessary to place more furniture in the foot margin on the side of the long cross-bar next to the gripper than on the other side. The lowest folio of a form should be placed next to the gripper edge.

When it comes to the important question of book margins, such a question, in many instances, can only be decided by advice from the superintendent of the plant. Why? Because in these days many different styles of books are being designed, some having even margins around each page; others having an extra amount of margin at the side and foot of each page; others having very wide margins at the side and foot of pages, and so on. Then, such matters as folding and binding must receive careful consideration. Is the book to be sewed, flat wire-stitched, saddle-stitched, or hand-corded? If to be sewed through the folds or saddle wire stitched, less margin for binding will be required than would be the case if the book was to be flat wire-stitched. Saddle stitching is done for a countless number of booklets, catalogs, magazines, pamphlets, etc., which are not too thick as to number of pages to require another kind of binding. When a magazine of many pages, for example, consists of a number of signatures, flat wire-stitching is done through the back margin of the book to hold the signatures firmly together. Large-size bound books are made up of many signatures, sewed together at the back, each signature usually consisting of 32 pages. All of these technical points relating to margins must be thoroughly understood by the imposition man who is constantly working on book forms, and he should also be familiar with the requirements of the leading makes of folding machines. Some makes of folding machines are designed to take large-size sheets calling for intricate folds, while others are intended only for the general range of folds as applied to book work.

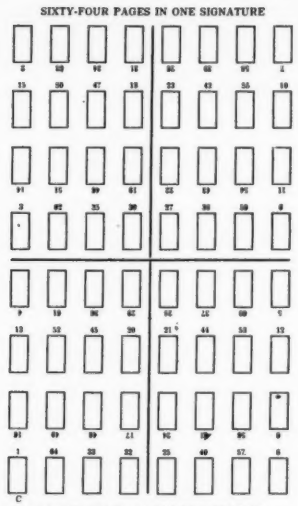
In many cases, the head and foot margins of a trimmed book are of equal proportions, while in many other cases the foot margin of a trimmed book is greater than the head margin. The imposition man should always make sufficient allowance for the extra trim which will be essential at the foot of a book. No matter what the page size of a book may be, the binder as a rule finds it necessary to trim off more paper at the foot than at the head, on account of variation in the sizes of the large sheets.

When the pages for a book have running heads one-third or less shorter than the width of a page, one-half of the space occupied by the running head should be thrown into the head margin, for the reason that the white space around the head is to be regarded as part of the head margin. When a folio is placed at the top of a page, the head margin is to be calculated from the top of the page, just as though the folio had not been there.

In forms of 32 pages or more the pages should be imposed, whenever possible to do so, so that the sheet may be cut and folded in signatures of half the number of pages, particularly in the case of heavy paper. When the form is imposed to fold as one complete signature, it is then advisable to deduct enough from the back margin of the inner sections to equal the extra space taken by the fold of the outside sections. With forms of twelve or 24 pages care should be taken that the head and foot margins of the inset be folded in accurately. The head and foot margins of such forms should be evenly divided, and the register will be more satisfactory if the inset is cut off from the sheet and folded separately.

Time and labor can be saved in any composing room where large forms for cylinder presses are imposed by the installation of a patented form truck. One popular make of form truck is strongly constructed of iron and steel, and is adjustable to line up with the surface of imposing tables and with the beds of cylinder presses. The form racks in the composing room can be arranged to line up with the ledge on the table part of the device, when the table is in a tilted position, so that the heavy forms can easily be moved from the racks to the table of the truck, and *vice versa,* without any lifting. With the use of this truck a large, heavy form can be moved from an imposing table to the bed of a cylinder press with no lifting on the part of the imposition men, and there is absolutely no danger of "pied" forms.

A small form truck, consisting of a pair of wheels and a solid iron body with a groove for holding the edge of a form, is also a useful thing in a composing room. One truck of this style has wheels with iron tires, while another style has wheels with rubber tires. To save time in the transportation of forms, one of these trucks should be kept in the composing room while another should remain in the cylinder pressroom.



LAYOUT FOR 64-PAGE FORM.

Among the most useful material for certain kinds of imposition work is "mammoth" iron furniture which is made in some 65 handy sizes from 15x15 to 60x120 picas. This material is invaluable for blanking out large, open forms, such as those for blank books, headings for ruled sheets, blank pages in book forms, etc. It is also admirable material for locking up small forms on the bed of a cylinder press.

Combination chases of various makes are in successful service in many printing plants, and among the best of these are the "McGreal" combination, sectional steel chases, the sections for which come in lengths of from 4 to 62¾ inches. From a standard font, or assortment of these sections it is possible for the imposition man to make up 153 complete steel chases of different sizes. These sections make ideal heading chases, and they are also useful for locking up small forms on the bed of a cylinder press. Moreover, the sections can often be used for blanking out large open spaces in cylinder forms. The chases can be made up quickly to fit practically any shape of form, and the chase may even include a cross-bar when desired.

One comparatively new device that is of interest to imposition men is a patented adjustable chase and lock-up. This device dispenses with the use of ordinary furniture; in fact, no furniture is required to lock up a form in this unique chase, as it is equipped with steel bars and lock-up units which are adjustable to any size of form.

Britannia Metal—VIII

The Turned Candle-Stick

Professor William H. Varnum, University of Wisconsin.

PEWTER came into use when the economic conditions of the people demanded a metal for purely utilitarian purposes and at a minimum cost. When conditions of this nature are in evidence, *simplicity of enrichment* and *true service* must be present in each article made, a spirit I have endeavored to maintain throughout the series.

While it is true that we have passed out of the age of complete dependence upon candle-sticks and candles, is it not felt that something of the simplicity of early times, the atmosphere of our forefathers comes back to us in the subdued gleam of the candle-light? Every hostess knows of the aesthetic reactions of candle-light upon her dinner guests and what could add more to this picture than the dull sheen of britannia candle-sticks? When not in actual use, candle-sticks of good design and in harmony with the furnishings add effective accents to the living room or sideboard. In many summer cottages, the candle-stick is an indispensable institution.

In the use of *metal,* one is true to historical precedent; moreover there is a sense of solidity, permanence and utility inherent in a metal candle-stick which to me is partly lost in the prevalent use of wood.

Mould Construction

Continuing with the mould construction of the columnar candle-stick begun in the April issue of the

AMERICAN SILVER SALVER.
(Courtesy of the Boston Museum of Fine Arts.)

INDUSTRIAL ARTS MAGAZINE, the model or pattern has been constructed and slipped free from its tapering wood or steel mandrel.

Our first task is to divide the pattern equally into halves by drawing light pencil lines exactly in the center and by the method shown in Figure 1, Plate 3. The present construction calls for a three-piece mould, involving new problems. A box or flash is to be constructed of one-fourth inch wood, or tin, exactly enclosing the ends of the pattern but clearing it on the sides by about one inch. The form is joined at the corners by the method explained in Article 6.

Fill the lower part of the flask with clay or plastelene and imbed the pattern in it *exactly* to the center line on each side, leaving about one inch between the lower part of the model and the bed upon which it

stands. An equal space must be allowed between the model and the sides as may be seen in Figure 3. Revolve a dime in the clay bed to form notches, two of which on either side will be sufficient. Coat the pattern with parting mixture as well as the form and pour it from its mould. If the mould has been poured to a point exactly on the center line of the pattern and the pattern previously coated well with the parting mixture, permanent adhesions to the mould will not occur. As a precautionary step, it is well to wipe the pattern with

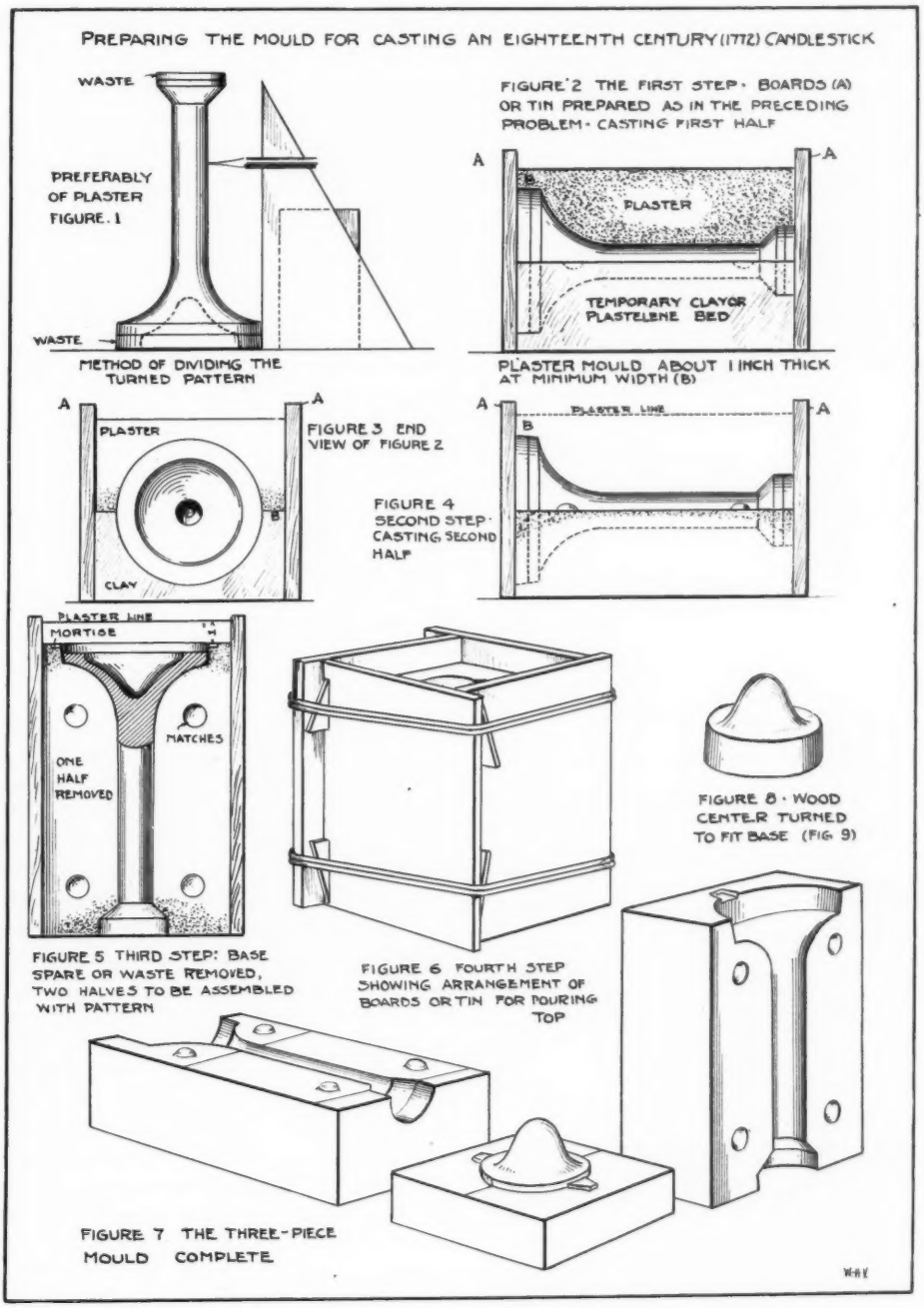

PREPARING THE MOULD FOR CASTING AN EIGHTEENTH CENTURY (1772) CANDLESTICK
WASTE
PREFERABLY OF PLASTER FIGURE. 1
WASTE
METHOD OF DIVIDING THE TURNED PATTERN
FIGURE 2 THE FIRST STEP. BOARDS (A) OR TIN PREPARED AS IN THE PRECEDING PROBLEM. CASTING FIRST HALF
A
A
B
PLASTER
TEMPORARY CLAY OR PLASTELENE BED
PLASTER MOULD ABOUT 1 INCH THICK AT MINIMUM WIDTH (B)
A
A
PLASTER
B
B
CLAY
FIGURE 3 END VIEW OF FIGURE 2
A
A
PLASTER LINE
B
FIGURE 4 SECOND STEP. CASTING SECOND HALF
PLASTER LINE
MORTISE
TENON
MATCHES
ONE HALF REMOVED
FIGURE 5 THIRD STEP: BASE SPARE OR WASTE REMOVED, TWO HALVES TO BE ASSEMBLED WITH PATTERN
FIGURE 6 FOURTH STEP SHOWING ARRANGEMENT OF BOARDS OR TIN FOR POURING TOP
FIGURE 8. WOOD CENTER TURNED TO FIT BASE (FIG. 9)
FIGURE 7 THE THREE-PIECE MOULD COMPLETE
WHY

PLATE 3. CONSTRUCTION OF A CANDLESTICK MOLD.

the plaster steadily into the form, until it reaches a point about one inch above the highest point of the pattern. Gentle tapping of the table top will help to free the plaster from air bubbles.

When the plaster is set remove the pattern from clay investment and, working slowly and with care, free sweet oil, after doping and preparatory to casting, using care to remove all surplus oil.

Again doping the model, replace it within the mould just completed, Fig. 4, which likewise should be well coated with a parting mixture; re-assemble within the flask and pour the upper half of the mould. After

the mould has set, use an old kitchen case knife or small wooden wedge with which to separate the halves.

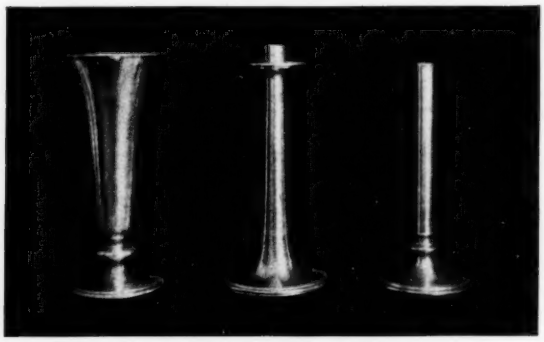
At this point, replace the pattern on its taper mandrel and turn off the spare on the *base* end, remove from mandrel, stop up or fill the spindle hole with clay or other substance and with a scraper, cut the mortises, one of which is illustrated in the half-mould of Fig. 7.

The last and third step calls for the assembling of the pattern, with its two sections now completed, enclosing the same by thin boards or tin as depicted by the partial section of Fig. 5 and the perspective of Fig. 6. Binding the whole together, still further increase the tightness of all joints by inserting wooden wedges as located in Fig. 6. After doping all surfaces to be brought into contact with the remaining section of the mould, pour the plaster to a thickness of one inch, and after setting, separate with wooden wedges, trim superfluous edges and the three-piece mould with natches and mortises complete for assembling stands completed (Fig. 7).

Preliminary to casting, take a small, sharp tool and draw a number of air vents, indicated by the single lines of Fig. 7 and dry out so that all presence of moisture is removed. There is grave *danger of an explosion* if this latter provision is not followed explicitly. For casting, one should purchase a fairly large wrought steel melting ladle; one holding 1¾ pounds will contain enough britannia for most candle-sticks. Powder the mould with finely ground charcoal, melt the Number One Britannia and pour in a steady stream into the closely bound mould which, for the best results may be slightly warmed.

For the final lathe turning, form a hardwood center to fit tightly into the base of the casting. Fig. 8. Attach this to a screw face plate, countersink the socket end for the dead center and proceed to turn the moundings, using a thin cardboard or tin template for a guide *until* one has so trained the eye as to render the curves of the design with precision, marking off only the larger divisions with the dividers. By depending upon the eye for correct curvature, much more satisfactory curves are produced with a truer spirit of the original design.

In order to retain the candle in position, the process described in the last paragraph needs the addition of a cylindrical attachment soldered to the socket, within which the candle may be secured; an element to be considered in the initial design. The holder may be varied in shape and thus secure accord with the general design of the shaft and base. The average size for the candle is a socket ⅞ of an inch at the top and tapering to ¾ of an inch at the bottom with a depth of 1 inch.



MODERN PEWTER WARE.
(Courtesy of L. H. Vaughan.)

While by soldering the addition of the socket is a simple form of construction, it is not typical of old time processes, where emphasis was placed on one-piece construction demanding a candle-socket hollowed out from the original casting. There are many advantages in this but the process is more difficult.

Briefly the process is summarized in Fig. 9. Using the wooden center of the simpler process, one substitutes a ¾ inch drill with a taper shank in place of the dead center of the lathe. After lubricating freely with soap and water, rotate the lathe at slow speed or by hand; drill to the depth of one inch. With a reamer, taper the hole with a maximum width of ⅞ of an inch at its top. To avoid the danger of twisting the socket from

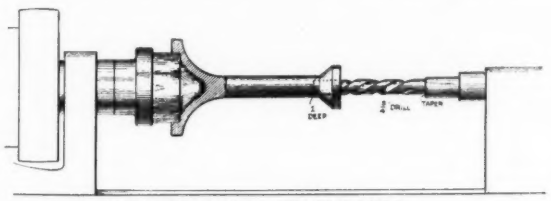


FIGURE 9 METHOD OF CHUCKING AND DRILLING CANDLESTICK

the shaft, *drill before turning;* if the drill cuts too fast, reduce its cutting angle.

Before turning, shape a small wooden center to fit the candle-socket just completed; this will serve as support for the dead center. A saucer-like depression on the top face of the socket will act as a drip retainer. After turning, the candle-stick should be burnished to a bright, even surface, and afterwards dulled with fine pumice stone and oil, if one desires this type of finish. Glass or metal drip cups will give extended protection, particularly if the candle, subjected to a draft of wind, manifests an inclination to drip.

As the designer-craftsman progresses in proficiency with casting, the original pattern may be turned still nearer to the desired shape, leaving a comparatively small amount of metal to turn down before the final shape is reached. Candle-sticks with square bases or shafts may be moulded with one diagonal of the base in a horizontal plane. This allows the pattern to be freed from the moulds with greater ease, afterwards finishing the casting with half-round or other files, fitting its contours and completing the process with fine emery cloth and the tripoli buff.

In closing the subject of candle-sticks, an old custom of auctioning 'By the inch' is interesting. Upon the occasion of sales, a small stub of candle was lighted and placed in the stick. While the candle burned, the bids mounted higher and higher. When the candle had burned out, the last bidder before the flame expired became the purchaser of the stick.

HOUSE JUST BEING FINISHED. ALL CONSTRUCTION, INCLUDING MASONRY, DONE BY BOYS.

Practical Home Building

E. C. Kerr, Instructor, Mansfield, Ohio.

The home building program of the Mansfield high school has passed the experimental stage and has been accepted as an essential factor in our school work. It did not immediately meet with universal favor, and at every stage it has been subjected to a critical investigation. But its successful development has won for it the enthusiastic support of the best citizens of the community, and we are now planning an enlargement of the program.

One of the most important reasons for its beginning was the acute housing situation existing in our local community. Home building had been emphasized as one of the most important guarantees of national integrity, and when we were faced in our own city with a shortage of houses we felt the challenge to assist in meeting this immediate civic need.

A second reason was the intense interest the boys and girls were taking in the matter of home building. They were so much concerned with many of the problems of home ownership that they did not seem to be content with a mere abstract discussion of the question. Their interest had been encouraged in the classroom and the problems they raised seemed to merit a concrete and practical solution.

Probably the determining reason for undertaking the program was the desire on the part of a number of the boys to learn some of the building trades. We were convinced that their training could be accomplished in no other way so well as on a project which involved real tools and operations and the materials used in actual construction. Such a project offered a greater challenge to careful work and affords a more permanent reward for the time and effort involved. The building of a complete modern house is a man-size job and appeals to any red-blooded boy.

The enthusiasm of the boys of the construction class has contributed largely to the development of this work, and their suggestions have aided in formulating the plans that best meet our needs. We limit the class to twenty boys, but there is a waiting list twice as large. All of the academic work is placed in the forenoon program, and the afternoon is devoted entirely to field work in construction.

The actual work of construction is preceded by a thorough study of every phase of building. A class in house-planning carefully considers every feature that should enter into a modern home and makes suggestions as to what the proposed house should include. These suggestions are then discussed carefully by the boys of the architectural drawing class and, as far as it is deemed advisable, these suggested features are embodied in the plans for the house as they are worked out.

A detailed study of building materials is deemed essential and the boys must be familiar with the prevailing prices of material and labor, because they are required to make careful estimates before the plans are finally approved. When the plans are completed, blue prints are made, specifications are drawn up and a bill of materials is made and subjected to a careful study.

The next important problem considered is the choice of a suitable site for the house. Here again local conditions must be studied. The various sections of the city are discussed from the standpoint of their comparative residence value and the consequent probable salability of the house when completed. A keen interest is taken in this matter of location and some very timely and enlightening arguments are advanced in defense of the various locations suggested.

When the location is determined the lot is surveyed and a plat is drawn to record not only the boundary lines but also to show the exact location of sewer, water lines, gas line, and such other data as might prove valuable to the future home owner. This also serves as a guide in the location of the house and the planning of

FIRST HOUSE FINISHED BY BOYS. DESIGNS COMPLETED AND ESTIMATES MADE IN CLASSROOM.

the landscaping which is essential to the completed home.

So far as it is possible, the boys' major interests are ascertained, and as the work of building progresses each one is given an opportunity to do the kind of work that will prove of greatest value to him. But it is understood that every boy may be called upon to do any part of the work, since he is striving not only to develop technical skill but also to acquire a good general knowledge of every part of the work of home building.

Although the chief emphasis in our work is carpentry, the boys do practically all of the work excepting the plastering and plumbing. They assist with these and are given expert instruction in both by the men who are employed on this basis. While there is not sufficient work of this kind to give them large experience, they can at least get a good general understanding of the character of the work and test their own fitness for it.

The rough work of excavating is done with a team, but the boys do the finishing, put in the footings and build the wall under close supervision. This offers opportunity for some important instruction in elementary masonry and necessarily involves a study of the proper placing of sewer, drains, water pipes, etc.

When the carpentry work is begun the class is divided into teams of two boys each. The team is assigned certain parts of the work for which it is held responsible. These assignments are so varied that during the course of construction of the building everyone is given an opportunity to not only learn how the work ought to be done but to do enough of it to acquire real skill in doing it. We employ regularly one very efficient union carpenter who assists the instructor with the supervision of the work of the boys and gives individual instruction.

In the house now under construction all of the wiring has been done by the boys and has successfully passed a rigid city inspection. The boys wire and hang all of the fixtures after having assembled them from the parts ordered from their specifications. It will be easily seen that this procedure necessitates a thorough understanding of the problems of house wiring and offers opportunity for the development of real technical skill.

One of the real problems with which we have been confronted in our program is the matter of financing the undertaking. To parallel the problems of real home building most closely the boys of the class are required to understand essential steps generally taken in financing a home in our city. We have asked no financial support from the board of education but have chosen to solve our own problems. When the estimated cost of the building is determined, we invite the cooperation of every boy in financing it, although we do not require this. A stock company is organized and each one is encouraged to subscribe for one or more shares of stock. Those who do not have the available cash are allowed to subscribe for the stock and pay for it by work done after school and on Saturdays. This plan encourages thrift and stimulates a vital interest in every phase of the building operations. When the building is completed, it is put on the market and sold in the regular way. A certain percent is deducted for tools and a reserve fund, and from the remaining profits a dividend is declared on all stock. While we do not allow the commercial aspects of the project to overshadow the educational phases, we believe that it is wise to teach the boys every phase of home ownership as well as home building.

The attitude of the business men of our city toward this work has been very friendly and helpful. We do not invite any philanthropic concessions, but we do welcome such extensions of credit as are consistent with good business. The loan companies are willing to assist by placing reasonable loans, and the material men extend us regular contractor's rates. The instructor has been willing to make rather heavy drafts on his own financial resources to insure the success of the work, but in no instance has this been more than a temporary investment.

Throughout the development of this program organized labor has been very helpful to us. At our request a committee was appointed to cooperate in working out a set of minimum standards of efficiency. These are made the basis of work sheets which are used in directing the work of the boys in the classroom and on the job. When these standards are met the local union will waive the usual apprentice requirement and grant a working card on the strength of the boy's demonstrated ability to do the required work in a satisfactory manner. This cooperation is mutually beneficial to the union and the school.

New problems are arising every day, but we take pleasure in solving them because we believe this work is making a real contribution to the community as well as fitting the boys for the more serious work they will undertake when they are out of school. If there are others who are interested in doing similar work, I would be glad to receive suggestions or answer inquiries that might prove mutually helpful.

Industrial Arts for High Schools

William V. Winslow.

THE aims of shop work in our high schools have undergone many changes, but these changes have not occurred so rapidly as one might expect when he considers present industrial demands. Emphasis upon skill as applied to hand tools has given way to an aim which puts understanding, an act of the mind, first, and leaves the kind of skill formerly required of the hand worker, primarily to the machine itself.

The school shop adapted the handicraft system somewhat after the methods of work in that system had been largely discarded in industry. This is not to say that hand work is not occasionally necessary in industry; it does mean that high schools are primarily concerned with machine methods, not hand methods. The greatest numbers of boys who are to go into industry, are to work with machinery in one way or another. Indeed, as has been so often pointed out, machine tools are employed to make machine tools. There is yet a vital need for industrial arts in the high school curriculum.

As practically all industry is dependent upon the machine for production, it follows that an understanding of the use and principles underlying machinery will later enable the worker to advance in the industrial occupations; it is readily observed that without an understanding of machinery little hope of advancement in industry is possible.

It is to be regretted that many high school courses in manual training similar in spirit to those taught twenty years ago still persist. It is more the matter of deep concern that shop work has been eliminated from some of our high schools, and in many instances where not taken out entirely has been pushed into the first year only. If work in the shop is to survive it will be agreed that this work must become worthy of being judged by modern educational standards. The purpose of this paper is to show not only why industrial work should occupy a most important place in the high school curriculum, but to point out some of the ways how this may be accomplished. In cities not large enough to provide a technical high school surely a way can be found to offer industrial work which is educational to a high degree and which can be made an indispensable part of the curriculum.

Shop work, traditionally, has been looked upon as a subject apart from other branches of school work. This may be due to the early recognized aims of manual training. Today shop work is becoming to be recognized as being closely related to other school subjects. We seldom hear of manual training for skill's sake, or character's sake. The recognized aims of industrial work today include, beside an understanding of industry, the clarifying of ideas gained elsewhere in the school curriculum. In the shop the ideas obtained elsewhere find application.

To begin with, then, the shop teacher must possess in addition to a good general idea of industrial organization and industrial society, an understanding and appreciation of other subjects in the curriculum outside his own; in fact, he may upon occasion appropriate some of their subject-matter. It will be agreed that it is in the shop that most school subjects find motivation.

Surely in the shop industrial history, physics, chemistry, design, representation, mathematics, and other school subjects find practical application; in this sense the shop may be considered a testing room for a large body of information gained elsewhere in the school.

Recent experiments show that very little that we have obtained ourselves as students of high school physics carries over to help us solve problems that come up in later life in industry or elsewhere. Through trial and error we learn in later life in much the way that children learn. While it is perhaps true that our high school physics does give us confidence *after* we have found *the hang of things* (if we recall the subject at all), it is doubtless true that a realization of principles could be made to help us to the solution of practical problems much more quickly if we could form the habit of associating these principles with matters at hand in the shop. Textbooks are being written which aim toward this accomplishment but the physics laboratory has rarely if ever become the shop where principles are clarified and thereby explained in a practical way. The shop teacher has opportunity to be of real service.

The application of science to practical ends has marked the recent rapid progress in industry, and this realization should be felt in the school shop. Boys take to machinery and are naturally interested in the principles underlying it. What better laboratory where a large amount of physical phenomena can be demonstrated?

Shop work has been taken out of some high schools for the reason that it has failed to function. It has not made itself a vital part of the curriculum. It has not related itself to other school subjects nor to conditions outside the school. When shop teachers wake up to present opportunities industrial work will find its proper and essential place in educational organization. The high school will not only prepare for the professions and commercial pursuits in a better way by furnishing an industrial background which is truly necessary from the standpoint of general education, but will prepare students later to assume the responsibilities and understandings of men in industrial society.

Boys Erect Six-Room Home. A group of boys, under the direction of Mr. G. A. Robinson, foreman of the carpentry division of the State Trade School, Meriden, Conn., have erected a six-room home. The boys range in age from 15 to 25 years and all are enrolled in the carpentry classes. A course in masonry has just been introduced in the school to include brick laying, plastering, and concrete work.

INDUSTRIAL-ARTS MAGAZINE

E. J. LAKE S. J. VAUGHN
Editors

EDITORIAL

BEAUTY IN THE COMMONPLACE

The Parent Teachers' Association of a large western city has enriched some of the schoolrooms with pictures of the city by a local artist. This artist has painted some of the commonplace views of the city, giving them sentiment, color and atmosphere that makes of them beautiful pictures. This particular artist is little interested in representing the broad avenues and orderly, pretentious architecture of which the citizens are justly proud. The members of the Association are, as a result, in contention over the comparative educational value of beauty in the commonplace and pretentious, civic design. Here is no minor pedagogical issue. We suggest that interest in the beauty of commonplace things is not liable to be overdone in American schools. We believe that pictures of very ordinary objects made beautiful by the conception and skill of a distinctive artist, will inspire children to the appreciation of beauty that exists for those who discover it in the ordinary, commonplace things of life.

Our point of view is not that of the engineer who insists that the best city plan is a checker-board because it is most convenient for transportation. We are quite willing to travel a little further if, as we travel, we can enjoy impressions of human interest that are not merely orderly or pretentious.

There is no more difficult conception to inspire than the beauty of common things. The Dutch painters who made beautiful pictures of domestic interests have given to the world a source of much enjoyment. Rare paintings by Rembrandt, Jan Steen and Jan Vermeer are of such commonplace subjects that a list of them is of little interest. Their value is in the beauty of values, colors, textures, light and shade. They direct our attention to beauty that is available everywhere but which is overlooked by those who have not learned to appreciate them.

The child often lavishes affection on a rag doll and neglects the ingenious walking, talking device that is almost lifelike.

This imaginative interest should not be discouraged and may be cultivated to a delightful interest in the beauty and sentiment of common things.

CRITICISM, COOPERATION, AND ADVANCEMENT

Schools and education have profited immeasurably from suggestions and criticism. The most helpful criticism has often come from those outside of the field of education. It takes considerable wisdom to offer some criticism and helpful advice. Such wisdom could scarcely be acquired except through genuine interest.

The manual and vocational lines of work probably aroused a more wide-spread interest in the subject of universal education than any other one influence in the last generation. When the laborer, the mechanic, the merchant, the farmer, and the banker not only take an interest in education but actually attend educational conventions and take places on their programs, progress is absolutely inevitable.

Time was when the presence of a farmer or a mechanic in a teachers' convention was regarded as a conspicuous and humorous example of presumption, if not impertinence. Now, however, education is no longer regarded as the exclusive business of a professional class. It is one of the chief concerns of every man, woman and child who pays taxes or who claim any rights under our government.

The way to avoid unjust criticism of the schools, therefore, is to take the public—the average citizen—into complete confidence. Complete understanding and information are the best insurance against dissatisfaction and distrust.

To be sure, when the results of industrial arts and vocational courses came first to be known, a great deal of vociferous criticism arose against almost every other phase of educational work. For a long time, one would have thought from the dissensions that the new form of education and the old "book education" were relentless and irreconcilable enemies. Now, we have come to see that both are necessary elements in the foundation work of all education. Teachers of general subjects and teachers of special subjects now look upon each other as worthy and necessary workers in the same great field of service. So it is that good, conscientious people often labor through conflict and antagonism to understanding, cooperation, and progress.

Verily the forces of democracy are levelers of educational barriers. Universal education is on the way.

THE PRIDE OF A CALLING AND INDUSTRIAL EDUCATION

Occasionally a philosopher of the type that is nowadays deemed quaint and queer pushes back his spectacles and becomes reminiscent. He recalls the day when practically every young man knew a trade and could with his hands fashion something that was useful to mankind. There was a charm and even a romance, in the thought that the boy was ambitious to become as proficient as was his father. There came a wonderful satisfaction in the sight of raw material as it assumed form under the manipulation of the skilled artisan. The finished product became a symbol of pride.

And then the old philosopher calls your attention to the change. Banks and business offices are now besieged with applicants for clerical jobs. Clerks and bookkeepers are a drug on the commercial market. The dainty, white-collared youth would blush to admit his

grandfather was an honest blacksmith or his father a wagonmaker. At the same time there is an acute shortage of skilled masons, bricklayers, plasterers, carpenters, painters, tailors, coopers, etc., etc.

"We have too many 'gentlemen' in the country," says the New York Commercial. "Of course, they are only fake gentlemen and hardly self-supporting, but they fondly deceive themselves into thinking they are the real thing. They know how to read and write—and seldom do either—but they can wear white collars and the clothing that they foolishly believe distinguishes them as men of class and quality in the community in which they live. Our fool system of teaching pupils in public schools anything but that with which they can earn a living has much to answer for. The worst of its crimes is when it transforms a boy from a manly youngster into a sissy too good to soil his hands with work of a constructive kind."

The general truth conveyed in this quotation cannot be denied. The fault, however, lies more with the home than it does with the schools. The latter are making great strides in the direction of industrial education and are investing manual labor with a new dignity and meaning. The fault must moreover be found in the modern home where a doting mother does not want her Johnnie to go into any occupation whereby his hands may become soiled, and where the father lacks the vision necessary to guide his offspring along proper channels.

True, the schools should foster a sound viewpoint on the activities of life, teaching the youth to respect the dignity of labor and the joy of a job well done. Moreover, the schools may well point to the fact that an industrial career affords the same opportunities that are found in the commercial field. The young man who possesses vision, enterprise, and energy will succeed in any calling that appeals to his liking and his capacity.

If one were to measure the successes in life—in the common acceptation of that phrase—he would find that the industrial field had produced more really successful men who have come up in the fields of commerce, finance, and transportation. There is always room at the top for those who possess creative genius and constructive ability.

There is no doubt that this country is in a transition period so far as its industrial life is concerned—a transition in which vocational training is playing an important part and which will eventually give a definite trend to the productive forces of the land.

THE TWO CONVENTIONS

This year the Eastern Arts Association and the Western Arts Association hold their meetings in May. One meeting is held in Dayton, May 6, 7, 8 and 9, and the other in Atlantic City, May 15, 16, 17.

These should both be great meetings. Strong programs have been prepared in both cases. The pioneer work of these great organizations has been wonderfully done. The recognition which they have demanded for art in our life and our school work has in some measure been granted. The follow-up work of constructive planning for a more wide-spread acceptance of art principles and a more adequate and successful teaching of them in our schools is vastly important. Such meetings help to focus the attention on strategic points and on the steps next to be taken.

There are probably no other organizations in which more genuine and wholesome fellowships and professional relationships exist. It is always a joy to be associated with such groups. The "old timers" will, of course, be there. If young teachers want inspiration and guidance for their work, they can get them in great abundance at these meetings.

THE IDEAL TEACHER

The ideal teacher in this new line of industrial work is one who has had academic, shop, and professional training; one who has teaching power, disciplinary ability, and a knowledge of the adolescent period of development; one who can win the confidence and respect of pupils, and who is popular with parents, associates, and pupils. Other necessary qualifications are a pleasing personality, tactfulness, adaptability, cooperative spirit, good judgment, and a character that cannot be questioned. He must not only be master of the fundamental principles of the trade involved, but he must be a skilled workman. He must understand the industries of the community in which he works so that the industrial work can be adapted to its needs. Some of these qualities are inherited, others are acquired.

The executive functions of a teacher of shopwork are many. He is a capitalist, a foreman, an employer, a buyer, an advertiser, a salesman, and a manager. As capitalist, he must see that his shop is properly equipped with machines, tools, and supplies. As foreman, he must see that the output of his shop is satisfactory both in regard to quality and quantity, assuming the responsibility for the selection, design, and workmanship of the projects. As an employer, he administers questions of discipline, making conditions for work agreeable and efficient. As buyer, he must see that equipment and supplies are provided for his classes. As advertiser, he must create a demand for his work as an instructor. As salesman, he must dispose of his product either to his pupils, or to the school, or to the public. As a manager, he must conduct his shopwork on sound business principles, keeping inventory records of equipment and supplies, and also, keeping an accurate record of costs. All of these functions the shop instructor will perform, if he is to be successful in his work. All of this in addition to his job of imparting information. As a teacher he imparts information; as an executive he gets the work done.—J. C. Park in The Vocationist.

Camp Cars — Wanderlust — and Some Other Things

Ray F. Kuns, Principal, Automotive Trade School, Cincinnati, Ohio.

IN the good old days when courting was done with the aid of a horse and buggy rather than a Ford coupe, I owned a sorrel horse. When I think of touring I am often reminded of him. When you were proceeding away from home all roads looked alike to him. He would jog along mile after mile and appeared to be enjoying the scenery along with the occupants of the rig he was drawing. Once, however, he was turned toward home, he took the bit in his teeth, and casting all discretion to the winds, he proceeded by the shortest possible route to his feed box and stall. He spurned the very dust under his feet. He took curves with the buggy on two wheels. The driver simply went along with him.

That horse would have made an ideal tourist. If it had been the privilege of his spirit to live in this latter day, he would have made some wonderful records. He would have browsed all around over the country into all manner of highways and byways. He would have stayed where he had strayed a thousand or two thousand miles from home until the last horn blew. Then he would have started home in one awful hurry. He would have made the last 413 9/10 miles in 11 hours, 33½ minutes, or busted a tug.

It is commonly said that baseball is the great American sport and pastime. That may have been true once, but for a sport which appeals to all classes alike, touring hits the bullseye. One may go to a ball game and on occasion rave like a madman and throw pop bottles at the umpire, but compared to pumping up a 33"x5" tire on the sunny side of an automobile in the middle of an August afternoon, consuming thick dust and listening to *Zoom, Zoom, Zoom,* and *Put-Put-Clat-Clat-Put-Put* of the passing cars, while the tired traveling companions express their most unwelcome opinions in sarcastic tones to the tune of the Klaxon's *Git-Hove-er—Git-Hove-er—I'm-a-Coming — I'm-a-Coming — Git-Hove-r-r-r, the flivver's Squank—Squank* and the *Shuv-Him-Hauff—Shuv-Him-Hauff—Shuv-Him-Hauff* of the big milk truck; baseball is, I maintain, to touring as the sport of swatting flies is to landing twenty-pound muskies.

Now, of course, I cannot speak with much authority about landing muskies, but I have pumped the tires and heard others tell of the landings. At any rate, Mrs. Kuns always catches the big fish. Mr. A. G. Bauersfeld, who is entirely responsible for this digression from the straight-and-narrow way of school routine, is another one who has put me to shame when it comes to landing the big ones. Whether it is Mrs. Kuns, or some other good sportsman who accompanies me on a fishing trip, the big one always falls to their lot, or might we say, hook. But it is in the winter that I shine as a fisherman. I have already landed more big fellows at my desk this winter than all my friends, and I landed in the last three years in Wisconsin which is justly famous for its big fish and the INDUSTRIAL-ARTS MAGAZINE.

One of the bright spots in my memory is a picture of my friend Bauersfeld as he sat in a rowboat on the bosom of the St. Mary's river at the Soo, his face beaming with pride, benevolence, pleasure, and six or eight other emotions which go to make up the facial expression of an extremely happy man. He had just landed the biggest fish of his career. I would like to tell you of the fight lasting minute after minute and hour after hour, how time and again he reeled him within sighting distance and had him dash madly away, how finally he brought him within range of the landing net, and of how three separate and individual times I had him (the fish) in the net, and he fell back into the river because I could not get half of him into the three-foot net at one time, how finally we tried to gaff him and then finally did land him. I hesitate to tell you the names I was threatened with if I lost that fish. I hesitate to even think of the disaster threatening me if the deed had not been done right. That it was done right is attested to by the fact that Mr. Bauersfeld has asked me to help in preparing this series of articles on camp chariots. However, I shall not tell you about the big fish; on second thought, I shall leave that to the one who landed him. I almost said how long he was, but fishermen must stick together.

It was entirely a coincidence which brought Mr. Bauersfeld and his family and Mrs. Kuns and I together on the camp ground at the Soo, where one can sit for hours day or night and view the big ships which transport the iron ore for the wheels of industry—a constant stream of high-riding whalebacks and ore freighters going up to the locks to Whitefish Bay and Lake Superior and another constant stream of low-lying and heavily-laden ones coming from the locks on their way to feed the hungry wheels of industry. Here one can sit and dream of the wonderful ages agone, and of the wonderful present, and the still more wonderful future to come, or one can visit the neighbor's camps and chariots, and this is the way the Kunses and the Bauersfelds met. They had come up on the west side of Lake Michigan, and we on the east. They were going the way we had come, and we the way they had come. But for three days we fished and talked camp cars, and once in a while the word *school* slipped in.

Our own camping experiences *en tour* date back to 1914. We spent seven weeks on the road and had a wonderful time. We wallowed around through the sand in Michigan, and the day when we made fifty miles was a red-letter one. On the last trip through that state we hunted three days for a little sand, and then only by going onto a detour were we able to find some, which looked like old times. Most of the sand no doubt is now hidden under Michigan's splendid concrete roads. Sand, like anything else, is right enough in its place.

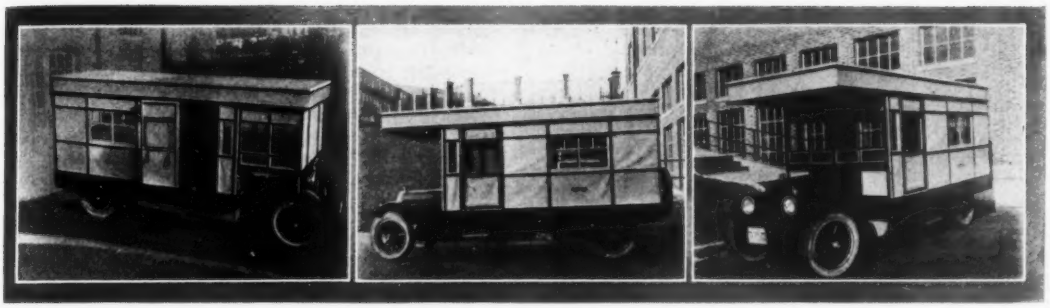
We met a party of Buckeye tourists coming down from Mackinaw City. We asked them how the roads were. "Awful!" was their comment.

"Can we get through with our house?" we asked them.

"By all means stick to the through roads. Keep off the detour. We just came through; it is terrible. It was all we could do to get through with our touring car."

In the morning we executed a strategy. We got off ahead of most of the tourists from the camp, and headed into the detour. We figured that being in the lead we would have much company when we got stuck. Our house was so large; no one else could get by until we were out of the way. We never found the bad spot in the detour, however. True enough, we traveled corduroy roads through swamps, we went through one farmer's timothy field, and another's potato patch, and still another's orchard and bumped around stumps and scratched off paint in the forests where the branches of the trees scraped on both sides and on the top, but with sand and bark under the wheels we kept going with far less effort than some lighter cars which would slip and slide in the sand. For three days over good roads and bad, we traveled in company with a "Pizzaro" touring car. The doctor who drove it finally admitted that in spite of the size of our house, "it sure could travel."

A camp car is more than a mere matter of transportation. If it were not, it would not be worth your time to read this article. When a man buys a lot, it may be very much like his neighbor's lot. When your neighbor buys a car, it may be an exact replica of yours, and you pat him on the back and congratulate him on his good sense. But when you build a house, who ever entertains the idea that it ought to be just like your neighbor's house? Impossible. There is certainly enough of the artist in any one of us to do a little better than our mere friends and neighbors when it comes to building a house. What a sorry sight it is to see a row of houses, every one just like the one on either side of it!



THREE VIEWS OF THE CAMP CAR. IN THE VIEW AT THE LEFT THE BED IS IN POSITION FOR USE.

People feel about the house-on-wheels much the same as they do about the permanent residence. They can save some money, they can get a better design, they can work more rooms into a limited space, their refrigerator takes less room, holds more ice, accommodates more provisions, requires less frequent icing, the bed sleeps better, the chairs are more comfortable, she does more miles per hour and consumes less gasoline, rides easier, has better lighting facilities, more head room, more storage space, better cooking arrangements, and so on, and on, and on.

Who will want to go camping and touring when every camp car is just like every other one on the ground? What will there be to talk about? I would like to get every reader of this to start planning and building a camp car after his own ideas. I would like for him to benefit from my experiences, those of friend Bauersfeld, and many others. For this reason I am showing several pictures and a drawing and am making some suggestions. However, I am not saying how much work is required. Why should I? Anyone who completes one will know. Then he can urge his friends to build, and pretty soon the builders will have a good gallery, made up of those who have built and now are dispensing advice, freely.

Just today I have had the pleasure of looking over a description of the house-on-wheels of one of our good Americans whose name we remember with pleasure each morning when we dip our spoon into our cornflakes. Now, he has a wonderful house which he has christened the Ark. He states that he named it thus because it was meant for traveling into unknown and uncharted places, I believe. He has that in common with Noah. But you and I have even more than that in common with that prophet of old. We can, and perforce as teachers must, build or do without. With the sweat of our own brow must we labor just as did Noah and his boys. The boys in our classes may be delighted, but the faith for the task must rest with the teacher. Noah was scoffed at when the sun was shining, but when the water started to fall in great quantities and the land gradually disappeared from sight, the shoe was on the other foot.

One month when we were on the road there were seven days when it rained for as much as six to ten hours at a stretch. While many of our camp neighbors must have envied Noah, we could rejoice with him, figuratively speaking, for we, too, were out of the reach of the water. I remember one camp close to Aurora, Illinois, where we settled down to camp, and it settled down to rain. We were snug and dry. As we read the Chicago papers we heard a humming and a familiar put-put. Two touring cars bearing tourists came into the camp ground. After casting over the situation, they finally made camp between the woodshed and schoolhouse, feeling that the position afforded a measure of protection. They went about getting their campfire started and putting up their tents. After several hours of slopping about in the mud they negotiated with the farmer across the way to put them up for the night. In my mind, half the pleasure of touring is in anticipation, one-half is in the actual accomplishment of the deed, and the other half is in recounting and telling your friends about it. And just to prove that my fractions are not mixed, I would like to say that you can add a fourth half to the fun by planning your own camp chariot. If then you do not have twice the fun you ever had before, you may criticize my figures.

The tardy bell has just rung, so now we had better get down to business. If I stop to whisper something about the events incident to touring from time to time, you may have to give me a demerit mark or two, but whisper I will. Our lesson this morning is on selecting a camp car chassis. To save time we will make it a lecture, and you may take notes.

Where do you expect to travel with your house on wheels? How many do you expect to take with you? Do you expect to do your own cooking? Do you want a refrigerator? Single or double bunks or berths? How much water do you expect to carry? Do you want a kitchen sink? What about lockers for wearing apparel? And most important of all, where are you going to carry the fishing tackle?

I believe in starting right where you live. Noah did. Have you a car? Do you want to use it, or are you going to buy a special chassis? Personally, I would suggest that the chassis specially fitted for the job is far superior to the one used for touring and fitted with two bodies. In the first place, changing bodies is not child's play, and sometimes one likes to use a job of this kind over week-ends.

With used cars selling as cheap as they are, the owner of a car has a chance to go onto the market and pick up a used job at a low price. In buying the job, however, several things should be held in mind. In the first case, consider tire sizes. If you are satisfied with the car you are now driving, look for another one of the same model. Then your tire problem is solved, since while you have two chassis, the tires and rims from one job are easily shifted to the other. Tires are the most expensive item when it comes to figuring depreciation. Old tires are the worst joy killer I know of in any case, but when you are on your vacation, they mean everything. If you have two cars and the one is used only for touring a month or two during the year and then rests on jacks for the next ten, it is a question whether you can afford to maintain the tire equipment; at least it would not be economical unless you were touring from seven to ten thousand miles per year.

Tires have been steadily decreasing in diameter and increasing in cross section until now we have the balloon tires. It is hard to predict what tire sizes will hold good for several years to come, but I would say that the Ford sizes 30"x3½", in the clincher, and the now popular 31"x4" straight side, and the 32"x4" and the 32"x4½" are likely to hold for some time. The last mentioned is the size used on the rear of the Ford truck and a number of the heavier passenger cars.

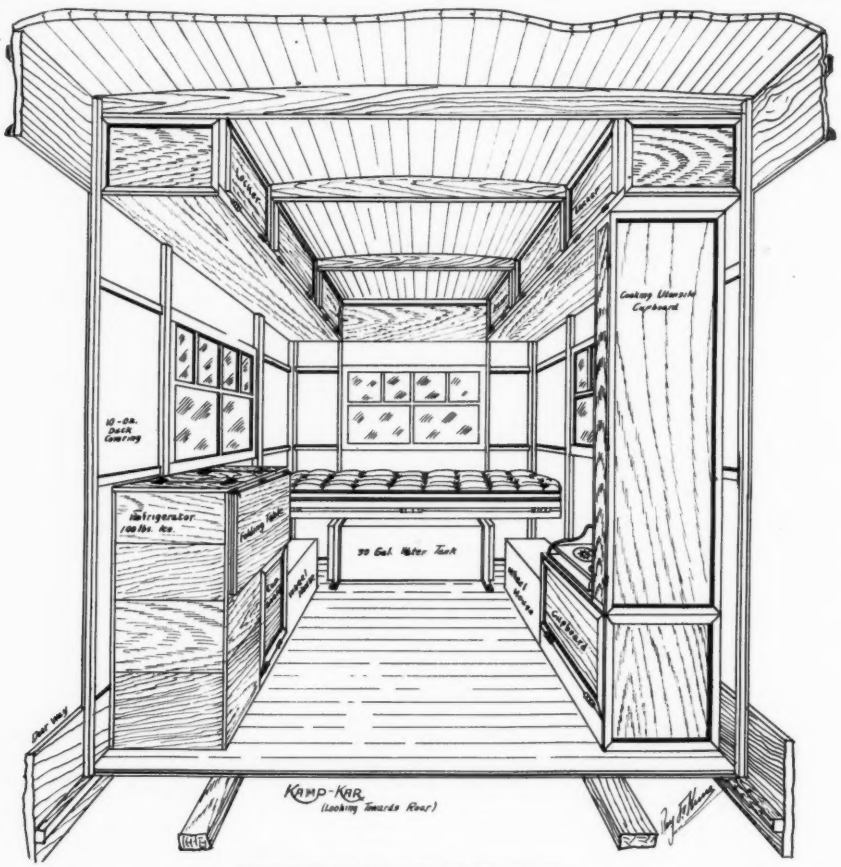
I anticipate that there will be large quantities of good rims and wheels thrown aside as the balloon tire craze sweeps the country. If you are one of those who want to take a whirl at the new styles, the way is open. You can now secure replacement sets of wheels, rims and tires for almost any make of car. I have given the balloon tire considerable thought with reference to a job of my own. I believe, however, that I will hold to my 33"x5" size for a time yet. In traveling over all manner of roads

it is likely that I will have at least equal satisfaction and certainly less expense. Since this is a Ford size (truck), I am likely to have better tire markets.

Now for the chassis which you have or expect to buy, or build: If you expect to build a job which has headroom for the average person when standing, you will have to go about six feet above the body sills. When this is done with the short wheel base, there is a tendency for the job to rock back and forth when on the road. It is not likely to ride well unless the wheel base is increased. This is due to the height as compared to the length of the body. Nor can the trouble be overcome by increasing the overhang beyond the rear axle. In this work, there are limits beyond which it is not wise to go.

steel were bought and laid out for the side members of the new frame. These were run from the front end of the front spring to a point a few inches beyond the rear end of the rear spring. This had the advantage of furnishing the body sills a support for their entire length. While the first year they had been set on edge to gain strength, now they were laid flat with the result that the body was lowered several inches.

The rear axle was moved back 24 inches, giving a wheelbase of 147" with an overhang of 36". This made a far better job. While rebuilding, the tire question was settled. I purchased eight wheels and twelve rims for the price of two tires. These wheels were then mounted on the two jobs I am now using, one for touring and the other



INTERIOR OF MR. KUNS'S CAMP CAR.

It is not wise to give over three to four feet overhang to a body of the type we have in mind. When a pound is placed back of the rear axle, it balances a pound in front of it. My first chassis under the job shown had an overhang of five feet. This, then, placed the weight of the rear ten feet of the body on the rear axle. There was no overhang on the front axle. Accordingly, much of the weight of engine and load about the front of the car also found its way to the rear axle. Even with four passengers seated well forward, and the load carried as far forward as possible, the load did not balance well. A total weight of 2,100 pounds was on the front axle, and 3,715 pounds were on the rear axle. While it did provide good traction in certain cases, as a rule the distribution of weight was bad.

After one season's use, it was found that owing to this poor distribution of weight and the lightness of the car frame and the type of spring suspension, it was advisable to build a new frame for the job. Accordingly, the body was removed and all the units stripped from the old frame. Two sections of four inch structural channel

for the usual driving. Upon occasion I change the entire set of rims and tires. The job of mounting an artillery type of wheel (wood) is one easily handled by any manual training man. If the wheel is not bored out large enough for the new hub, it may be mounted on the lathe and turned out, or it may even be filed or gouged out. If the hole in the wheel is too large, lay the hub on the floor and run lead or babbitt into the space to fill it up.

If the wheel base is to be increased, I would suggest that from 20" to 24" would be about enough to add to any given chassis. This is especially true where the frame is cut and a section riveted or welded in. If the builder wishes to lengthen a car frame and does not wish to weld in the new section or go to that expense, it is quite possible to do a good piece of work by lapping the ends from twelve to fifteen inches and riveting them together. In some cases this might prove better than the welding

[1]Mr. M. G. Nyman of Woodward High School, Cincinnati, helped to build the KAMP-KAR and he and Mrs. Nyman accompanied Mrs. Kuns and the author on the first trip into the North Woods.

which may remove the temper of the frame given it at the factory.[1] There are several ways of lengthening the frame either by adding a new and longer section to the rear, or what is more often done, cutting the frame at a central point and splicing in the desired length. This has the advantage of leaving the spring mountings at each end undisturbed.

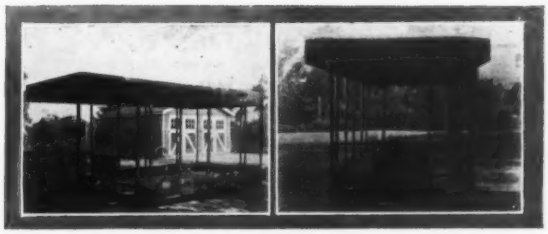
Brake rods and the propellor shaft then are lengthened to suit the new wheel base. If too much is added, there is danger of the propellor shaft becoming so long that it will whip and vibrate. In some cases it is necessary to swing in a special propellor shaft bearing. Cars having an exposed type of propellor shaft are most easily lengthened. Where the Ford or Dodge is to be lengthened it is best to use some of the units available for that type of job.

Spring suspension is another point deserving consideration at this time, that is, before buying the car or deciding on the body design. The best type of spring suspension for this work is the semi-elliptic front and rear. In the rear, the springs will be more satisfactory if they are the overslung (resting on axle housing) type. With the underslung, the springs are likely to be arched considerable and have long shackles. This does not amount to anything in the touring car, but when you put a high body on the chassis and drive around curves at thirty to thirty-five miles per hour, then the list is very bad. Where the three-quarter elliptic spring is provided at the rear, better results will be obtained by removing the upper quarter and replacing it with a solid frame member.

Americans are built for speed. You may think that you will not care for much speed with your new camping outfit. When you have everything else and some "bird" approaches you on the camp ground and says, "Well, you certainly have everything, but, of course, you cannot travel very fast," just as though he was the last authority on speed matters; you want to be able to smile up your sleeve, wink at the wife, and then lay for that "bird" the next morning and pass him up at 45 miles per hour. If he is not satisfied then to admit his mistake, you can hustle on down the road a piece and make him a cup of nice warm coffee while he is coming up. To be able to travel at any desirable speed, and desirable is, just the same with the car built for camping as it is with any other type of car, it is essential that the springs be right. Doubtless you will find that you need to add several leaves. The job pictured had the springs rebuilt after one season, so that there were eleven leaves to the front and fourteen leaves to the rear springs. To prevent an undue amount of rebound, the job was supplied with snubbers.

When it comes to axles, engine and transmission, you will have to take them pretty much as you find them. Judge your car according to its trade name and the reputation it has for giving service under adverse conditions. A job which is always causing trouble as a standard touring car, is not a job in which to put your trust. If you build a camp car, you will find that you have more room than ever before in which to store things. The body is certain to weigh more, and then with the load, the chassis is subjected to what might be called abuse. However, cars are like people, some will rise to the occasion, and others will show a yellow streak.

Before trying to put the chassis into shape, in fact before deciding on the chassis, it is well to make tentative plans for the body of the car. Look over all the plans you can find, read everything you can get on the subject, and then make your own house plans. Work in everything you think you might need if you were to live in the car an indefinite period. See how many cubby holes and dewdads you can plan. Put in three or four partitions, several portieres, a phonograph, a radio, gun cases, bait boxes, tool boxes, ice machines, water pressure tanks, and a score or two other things which I might mention. After you have all these things worked out to your satisfaction, have the plan framed and hang it on the wall, where it will pass for a cubist's art. Then take your pencil and drawing board and lay out a job carrying the necessities of life.



THE FRAMEWORK OF THE CAR TOP BEFORE MOUNTING ON THE CHASSIS.

One of the first necessities of life is good rear vision. Many a life has been snuffed out because the driver could not get a clear vision rearward. Traveling in a strange country, which is where we all want to travel, is certain to entail enough risks without those certain to be added when partitions are run into a car in such manner that the view to the rear is cut off. Another necessity of life is good water. If a tank is provided in which a good quantity may be stored, it is possible to have safe drinking water with just a little care. A refrigerator is not a necessity, but it is a source of much satisfaction. While its main purpose is to keep the fish you catch, nice and fresh, it can be put to other worth-while uses.

Good beds and comfortable chairs are essential to a pleasant trip. While actually touring about, 75 per cent of the time is spent driving or sleeping. In the job shown here, the chairs are upholstered with the material taken from the old touring car body. The frames for the chairs are made from $\frac{7}{8}$" poplar mortised together. Webbing is run over the frame, and springs set on the webbing and over the springs the usual covering, and then the upholstering material. The beds are built-up frames carrying springs and light-weight mattresses.

It will be noticed that in the construction shown, the body is even wider than the running boards of the average touring car. In 1918, while on a short trip through Michigan, I drove a touring car. One day while contemplating the camping impediments (see Cæsar's Gallic Wars of high school fame) stored on the running boards, the very obvious thought came to me that if the sides of the car were built at the edge of the running boards, the pots, pans, beds, etc., etc., might be a great deal safer and cleaner, since then, they would still be inside the car rather than on the outside. It has been a source of great satisfaction to me since using the camp car to listen to scores of people give voice to the expression, "Why, everything is put away!"

Plan plenty of lockers for clothing, personal and bed. When on a short vacation, one does not like to do much washing of clothing. It is easy to carry a bit extra. When one wakes up at 2:00 a. m. with the frost gathering on the windows, he wants to know just where to lay his hand on an extra half dozen army blankets. Add to the above mentioned necessities a two-hole burner stove, either gasoline or oil, and with a table on which to set the fried fish and flapjacks, the drawing may be said to be nearing completion.

Width of body is one of the first things which will need to be settled. I determined the width of this body by allowing just sufficient room on the inside of the car to permit the bed to be placed crosswise. This made the outside of the car 78", and the inside about 74". I would not advise any wider than this for cross country touring. I have been in a few places where an inch or two more in width would have held me up, and have been held up because of the height, once or twice. In such cases one simply has to say with the fox that the chances are, the grapes are sour anyway. Some states, I believe, regulate the width of vehicles on the highways, but this I think is about 85". In this job, again the question of changing tires was of moment. To make the entire job just as simple as possible and to conserve space, we held to square corners. By setting the top and bottom panel boards

A REMINDER OF OLD TIMES, THIS PINE TREE STANDS IN THE CENTER OF THE ROAD. THIS IS THE WESTERN END OF ROUTE 12, UPPER PENINSULA, MICHIGAN. THERE ARE ABOUT 200 MILES OF VIRGIN FOREST ALONG THIS ROUTE.

on edge, we were able to get great strength. To cut out for the rear wheel and a fender, would have made the job far more difficult and heavy as well. With the width at 78" no trouble is experienced in making tire changes.

The posts bolted to the top and the lower panel boards are oak and only 1⅜" square. The top panel boards are ⅝" thick, and the bottom ones are ¾" thick. Five-sixteenths inch carriage bolts are used to bolt the body together. All cupboards and lockers as well as the refrigerator, are made from ⅜" poplar stock. To give the effect of paneling on the doors, a strip of lattice material is used as an edge mold, having the corners mitered.

Ten ounce duck was used to cover the roof and for the sides. With the posts in place, the duck was nailed over the outside of the posts and on the inside of the panel boards. Lattice stripping was used for a mold and nailed over the posts and over the inside edges of the duck. Lattice strips were also run along the top and bottom of the windows. Wherever a strip was nailed on the outside, a like piece was placed on the inside and the duck thus secured between the two strips. This construction made a very flexible top and one of surprising strength. In three years' service it has shown no defects whatever.

Perhaps the most novel arrangement about the entire plan is the bed in the snout or roof projection over the radiator. The windshield is made in two pieces, and one-half swings to either side so that it makes the side of the car appear that much longer. After these two frames are open, a third frame is arranged to drop, on hinges, between them and thus make the front wall or end of the car. The bed, which is made up of a light poplar frame, is then lowered into this space which it just fills. When lowered, it rests on hooks at the front and on the bottom of the windshield frame. No weight is carried on the radiator or hood. The bed is lowered and raised by means of four ropes—one to each corner—and a small windlass. The bed is then stored in the roof while traveling and it is complete when lowered, since all covers, etc., are left on it.

AUTOMOTIVE TRADE SCHOOL TEACHERS ON A WEEK END AT FORT LARAMIE RESERVOIR. THERE ARE FISHING RESORTS IN OHIO, TOO.

While I could go on indefinitely telling about this and that, space is limited. I could tell you just how to mix your white lead and boiled oil and drier to paint the duck, how to run in a couple of lights to use the surplus juice from the battery at night and thus keep it from overcharging in the day, how to build the tool box under the floor, how to connect the gasoline stove to the gasoline tank by using a vacuum tank and a small exhaust pump, how not to waste time with a water pressure system but to place an ordinary tap on the bottom of the tank from which to draw a supply in a basin or coffee pot, depending on what you have in mind, how the ice box can be made heat proof by laying lattice strips between outer and inner walls so that a hundred pounds of ice lasts from Madison, Wisconsin, to Cincinnati, Ohio, on a lazy six-day trip—in fact, I could tell you many things which you will discover for yourself while building a camp car.

Building camp cars deserves some such recognition as accrues to the builders of water craft. There is no reason that these jobs should not reflect individuality. Here's hoping that you will get yours finished for the vacation this summer, and when we meet on the camp ground, that you will lose no time in telling me how complete you have your job, and how much better it is than mine. Maybe you can tell me how to fit in a boat and a portable motor. That is what is bothering me now. Anyone desiring more complete plans and dimensions may secure them without cost by addressing the writer at Madison Road and Erie Avenue, Cincinnati.

WHAT AMERICAN INDUSTRY NEEDS

"There is a rapidly growing need for administrative and technical ability in practically all lines of activity. This is especially true of the manufacturing and mechanical industries." So the situation in the industrial field is summarized by Magnus W. Alexander of the National Industrial Conference Board which constitutes an affiliation of national bodies engaged in manufacture.

The statement is made that out of a total of 41,614,248 persons engaged in the gainful occupations 12,818,524 are engaged in manufacturing and mechanical industries. Also that there is still an impression that the industries must recruit their ranks themselves, while in fact educational institutions exercise a strong influence in stimulating mechanical efficiency.

In touching upon the higher institutions of learning Mr. Alexander says: "The responsibility of industry in connection with engineering education is much greater than has been realized heretofore. It is now evident that every industrial corporation of any considerable size must have a well thought out educational policy for the development of its leaders An adequate policy involves a measure of assistance to the engineering schools and colleges in the development of their courses of study and in providing opportunities for practical experience for the students Such a policy also involves adequate methods of training within the industry.

"Many of the engineering schools are rich in buildings and equipment, but all need help in improving the effectiveness of the teaching force. Industrialists can assist in finding and developing men for this service, with the necessary qualities of character and personality as well as of knowledge. They can increase the esteem in which educators are held. They can provide the opportunity for the instructors to maintain the necessary contact with industry and its needs and to become acquainted with the latest industrial methods and practices. They can thus increase the attractiveness of the teaching profession for men who have the teaching instinct and logically belong in this profession."

The Kitchen Table as a Shop Project

J. I. Sowers, Director of Vocational Education, Miami, Fla.

The kitchen table is the most common, most useful, and the most used article of household furniture, and yet we seldom see it designed and built in school shops. This piece of furniture so long neglected can be made to express just as much skill and thought as any other common piece of household furniture if a little thought is expended upon it; indeed it can be elaborated into a cabinet of drawers and bins, as is often done in the commercial article and out of which grew the modern kitchen cabinet.

In making a kitchen table the first thing to consider is the correct working height. The best working height for a table may vary all the way from 28 to 33 inches. If mother is short, 28 inches will likely be about the correct working height; while if she is very tall, 32 to 33 inches may not be too high. Recent investigations have shown that the height of such articles of kitchen equipment as the sink, table and kitchen cabinet, bear a direct relation to working comfort and fatigue; several manufacturers realizing this now feature these articles in different or adjustable sizes.

Having decided upon the height, the next important thing is the character of the top or working surface. No kitchen-table top was ever meant for a workbench where the boy of the family may straighten iron rods or crack nuts, but it certainly was meant to hold up under all the burdens of kitchen and household work, and to present a fairly smiling surface after years of contact with things hot and cold, light and heavy. It must be non-cracking when heavy objects are brought into too forceful contact, chipless, non-absorbent, and cleanable, unaffected by grease or acids, and must withstand sudden extreme changes of temperature. It must do all of these things and yet come up smiling and ask for more.

From the foregoing it will be seen that the selection of a proper material for a table top involves a rather large order and some careful selection.

The white poplar wood top of our grandmothers, while not answering all the above requirements, and though not the best top material to be had in this later day, yet makes a very good kitchen-table top. Scoured to snowy whiteness, with powdered brickdust or sand—the common kitchen abrasives of another day—the top served for years in colonial kitchens. If the top is to be made of wood never varnish it; it must be finished natural.

The top may be covered with linoleum, of the heavy grade known as "battleship linoleum"; this is quite heavy and comes in shades of green and brown. This will need to be bound about the edges and corners with a nickel-plated steel binder which not only holds the edges of the material down but prevents liquids from getting under the covering. On the whole, this makes a pretty good top. It is shock absorbing and will not break delicate china when set down carelessly as will a metal, glass, or composition top. In time, however, it will begin to absorb grease and stains.

Zinc tops were formerly used a good deal, but are unsatisfactory. They expand with use, puff up and become uneven and wrinkled; they also leave a metallic discoloration on the wiping cloths.

Table tops of tile have been used in the domestic science laboratory. These may be put on tables manufactured in the school shop, and afford in addition, a good exercise in tile setting. This material makes a very heavy table and should be used only on a working surface that is built in or seldom moved. These tops clean nicely, but often the cement used between the tiles absorbs acids and discolors in time.

Another very successful form of top is made of stone composition material, or cement used for laying bath room, kitchen and store floors. This comes in a powdered form and is mixed and applied like plaster. To use this successfully battens should be securely fastened across the wood base top of the table across the grain; this holds the composition material and prevents the top warping from the moisture. This composition top will not require a metal binder about the edges, but may be finished off at the edges with a round roll edge of the material itself. This material comes in several colors, and a shade may be selected to harmonize with the surroundings. The top is laid smooth with a trowel and an edging tool, and when set may be ground to a finish with an oil stone and water. A top made in this way makes a splendid working surface and an attractive table.

A heavy plate glass also makes a good top in many respects, but heat and sudden contact of heavy objects is likely to crack it. When glass is used it should be laid on a perfectly level base top, and under-padded with felt. Nickel corners are used to retain it in place; the edges of the glass are, of course, ground rounding. Marble, of course, makes an ideal top; it is so expensive, however, as to be out of the question except in some localities where it may be available from local quarries.

In the long run and everything considered, the porcelain enamel tops are perhaps best, and the cheapest of any material possessing similar qualities. These tops may be purchased by the school direct from the manufacturers usually at wholesale prices. They are also on sale at some hardware and department stores. Factory made tables having enamel tops are usually made without a base top. Such a top will give, and come and go, when weight is applied; this is undesirable when mixing dough or doing many other kinds of work. A well-made table with an enamel top should have a light-wood base top over which the enamel top is placed. These tops have rolled edges and are easily the cleanest and most sanitary of top materials. These enamel tops are, of course, glass and will chip if roughly used. These tops are being much improved in manufacture and the selection of a top of good design will reduce the likelihood of chipping. In using this kind of top it will be necessary to first learn the standard sizes in which these tops come.

The size of the kitchen table usually depends upon the size of the room and the needs. Sometimes a built-in table, with cabinet of drawers, may run across one side of the kitchen and not afford more working space than necessary. The shop student had better, however, confine himself to one of the standard sizes in which these tables are made commercially. The common sizes are 25x40 inches and 27x48 inches.

Since these tables are usually finished in white enamel a wide variety of cheap woods are available for their construction. When pine is used, however, it will be necessary to give the surface a base coat of shellac to prevent pitch from discoloring the enamel. If legs are attached by draw-bolting it will make for convenience in moving.

Few shop projects present the variety of interest and range of possibilities in manufacture found in the common kitchen table. A class working on this project, using different materials, finishes and tops, presents an interesting experiment to both teacher and students.

Two Trade Schools. The New York City board of education has included in its budget for 1924 appropriations for the purchase of sites and the construction of two trade schools for girls, one to be in Harlem and the other in Brooklyn Borough. The two buildings will each accommodate two thousand pupils and will be erected at an estimated cost of $975,000 each. The new schools will be built in response to a demand which has grown out of all proportion to the facilities. The waiting list for the Manhattan school alone ranges all the way from 500 to 1,000 pupils.

THE ORANGE-CRATE AND CANDY-BUCKET BIRD HOUSE

C. Anthony Van Kammen

Article No. 3

The purple martin requires a rather large room, six inches square. As a single candy bucket would not accommodate more than two families, a section, the 4½" rim removed from the bucket used in Article two, is added and a four family apartment is made possible. Before the rim is nailed on, a six inch partition is nailed through the middle in the bottom of the bucket. This partition will form the two upper rooms when the house is completed, as the bucket is to be inverted. Cut a circular piece for the floor that will fit snugly around the side wall and down on the edge of the partition. Nail in place. Make a second partition, 5¾" high, and fit this in at right angles to the one previously constructed. It must be notched at the edge of the bucket to come flush with the outside. See figure 1 (A). At (B) and (C), same figure, are given respectively the floor plans of the upper and lower compartments, showing the relative positions of the entrances which are directly opposite each other on the same floor.

Invert the bucket so that it rests with the center partition, which will extend about 1⅝" below the rim, on a level surface such as a bench top. Tack to the rim, inside the bucket, on opposite sides of the partition, two temporary legs made from thin orange crate stock so that

FIG. 3.

of 2½", begin as before, point (E), two inches back of the partition and continue around completing the base wall. As there will not be enough material from the other bucket to go all the way around, fill in the sections above the entrances with pieces from another bucket or with strips of orange-crate ends planed to proper thickness. The rim may be strengthened by binding it to the bucket with wire, using the kerf in the sections. If crate-end material was used above the entrances, a kerf can easily be sawed in it. A few twists

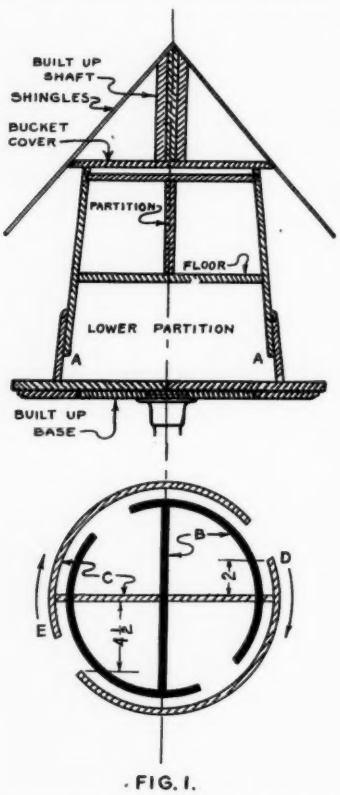


FIG. 1.

the perimeter of the bucket will be equidistant from the surface upon which the partition rests. The 4½" rim sections cut from the bucket used in article two are now nailed around the edge. Start so that the section will extend two inches past the partition, see (D), figure 1, and work around as indicated by the arrow to within 4½" from the opposite end of the partition. Leaving an entrance space

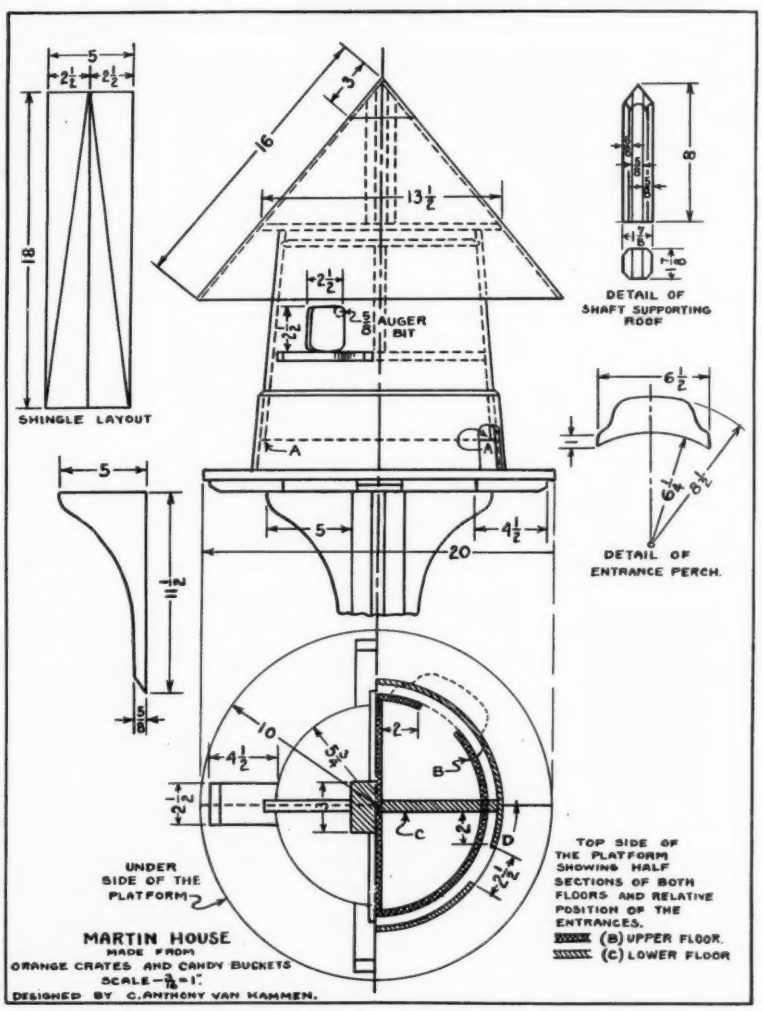

SHINGLE LAYOUT
DETAIL OF SHAFT SUPPORTING ROOF
AUGER BIT
DETAIL OF ENTRANCE PERCH.
UNDER SIDE OF THE PLATFORM
TOP SIDE OF THE PLATFORM SHOWING HALF SECTIONS OF BOTH FLOORS AND RELATIVE POSITION OF THE ENTRANCES.
(B) UPPER FLOOR.
(C) LOWER FLOOR
MARTIN HOUSE
MADE FROM
ORANGE CRATES AND CANDY BUCKETS
SCALE - ¼" = 1".
DESIGNED BY C. ANTHONY VAN KAMMEN.

FIG. 2.

in the wire will bind the rim firmly and the twisted ends can be hammered into the wood. Lay out the entrances 2½" high. Bore ⅝" holes at the corners and saw to the holes with a compass saw.

The base or platform upon which the house rests, is built up from five orange-crate ends and four pieces 2½"x4½". A circular piece, 11½" in diameter, is cut from one of the crate ends. The four other pieces are nailed to the circular member with a corner at the center as explained in Article one for the roof supporting base. With a ten inch radius, from the center of the circular piece, scribe a circle and cut to the line. The 2½"x4½" pieces are fitted one end against the circular piece and are used to cover up the joints and prevent the top pieces from warping apart. See working drawing, figure 2.

The construction of the roof is similar to that for the other bird houses. A bucket cover is centered and nailed on top of the body of the house. The roof supporting shaft is made eight inches long and is toe-nailed to the center of the cover, which is chamfered to form a surface for nailing on the shingles. Figure 2 shows a working drawing of the martin house, while figure 3 shows a house under construction.

The bird house may be supported on a long pole or, better still, a flanged pipe supported by guy wires.

Cement and the Boys

Leon H. Baxter, St. Johnsbury, Vt.

BOYS have always enjoyed making sand forts, tunnels and even old-fashioned mud pies, as far back as we can remember. I have found boys just as interested in making useful and ornamental things—not out of mud-and-water—but with cement, clean sand and water, and some small, irregular-shaped stones.

Most of the articles used in concrete work are easily obtained, and many of them can be made by any boy possessing a slight knowledge of the use of tools. In connection with the several processes, the boys are taught the history of cement from early times, down through the discovery made by Joseph Aspden, to the present time. They become familiar with the manner in which the ingredients are quarried, mixed, ground and burned, and with the way in which the other materials are added. They are taught the proper way to store cement, how to make forms, and how to mix, place and protect the work. In many cases, a boy who has finished the course in cement work has a more thorough knowledge of the material and its uses than some workmen in the trade.

To show what boys can do with this interesting medium, the writer presents the accompanying drawings and photographs. The photographs tell their own story. It should be kept in mind that every part of the work was done by hand, and also that the only person over 14 years of age on the job was the writer. The larger pieces of work were accomplished during the vacation periods.

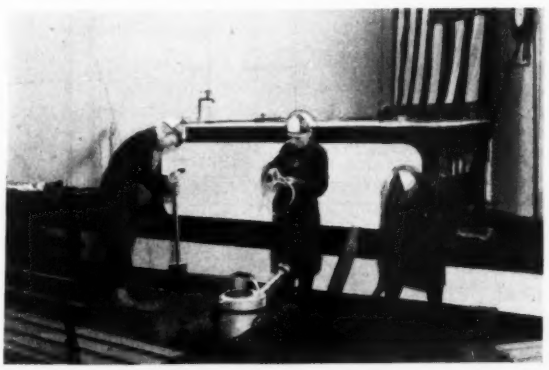
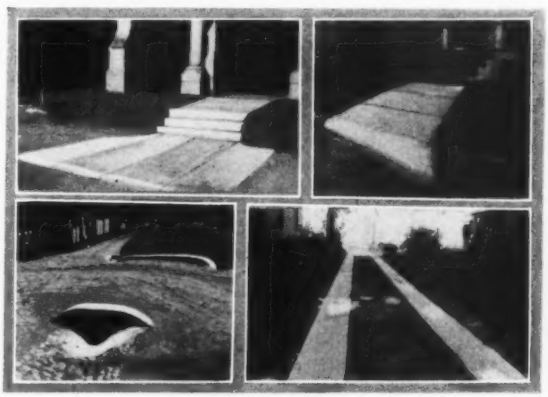


FIG. 1. THREE BOYS OF THE AUTHOR'S CLASS AT THE EASTERN STATES EXHIBITION.

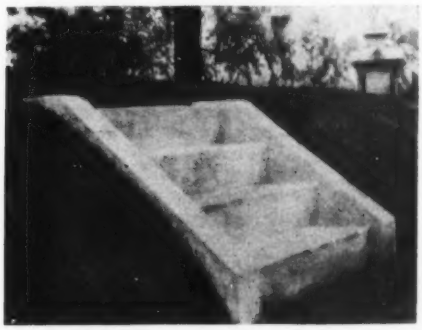
The photograph of the boys at work is of especial interest as it shows the three boys who won the Interstate Championship in Handicraft Demonstration of the North Atlantic States, at the Eastern States' Exposition, held in the fall of 1921 at Springfield, Mass. They represented the state of Vermont and were successful in winning the state championship prize. The boys competed at Springfield against 27 teams from various eastern states, from Maine to Delaware. Many of the teams were made up of boys 17 and 18 years of age, while none of the Vermont boys was more than 12 years of age.



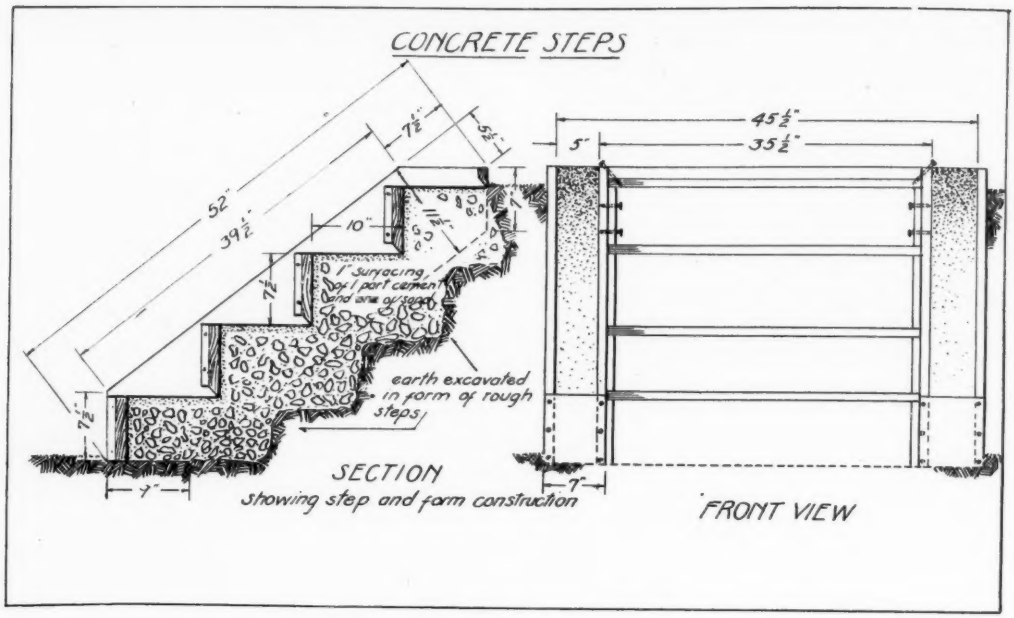
STAIR, WALKS, CULVERTS AND AUTO RUN-WAY MADE BY STUDENTS.

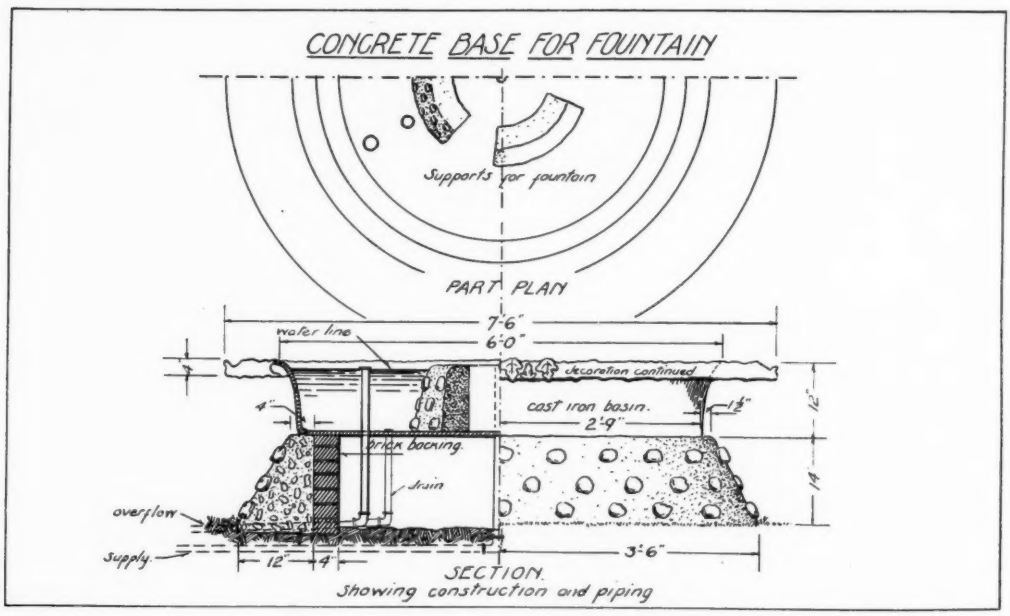
The boys engaged in the contest laid a section of a cement walk. While two of the team worked on the project, the third member described the work, telling the history of cement and its manufacture, the various steps involved in the work and illustrating by actual photographs the character of the work previously performed. Each boy spoke in turn and all were busy practically every minute of the time. The demonstration was directly in view of a large audience, and the work was of such an excellent character that the judges readily gave the group a score of 97 per cent. The boys were at the exposition a full week, and all the expenses of the trip were paid by the state of Vermont.

The character of the work done by the boys under the direction of the writer last summer is well illustrated in the photographs. The boys laid a sixteen-foot walk for a local physician, a fifteen-foot walk for a clothing merchant, a twenty-foot walk for a photographer, a fifty-foot walk for a manufacturer, and a sixty-foot automobile runway for a baker, showing as one boy put it, that they



A CONCRETE STEP DESIGNED AND MADE BY BOYS.





DETAILS OF CONCRETE STEPS AND FOUNTAIN.

had worked for the butcher, the baker and the candlestick maker. Other projects undertaken were the building of a culvert and steps at the local cemetery. The culvert was provided with a rubble drain.

The work done by the boys in the St. Johnsbury schools has extended over a period of eight years, and there has never been a failure in all that time. This is especially noteworthy when it is pointed out that the temperature in St. Johnsbury varies from fifty degrees and below in winter to one hundred degrees in summer. This variation in temperature makes possible a good test of the durability of any cement work.

The fountain shown in the picture was over fifty years old and had been in storage for a long time. The terra-cotta figures were chipped and broken in places and in generally poor condition. A mixture of one part sand and one part cement was made up. With this as a mixture, a new arm was molded and other imperfections restored. The remodeling of the figure was accomplished with the aid of a sculptor's modeling tool. The entire job was given a coat of a special cement paint. A pipe running through the umbrella handle on the figure permits a small stream of water to flow out at the top of the umbrella surface, giving the appearance of rain.

The bowl of the fountain was of cast iron. The foundation was built up against a brick backing and stones of uniform size were inserted. The piping of the fountain was inserted as the first step. After the concrete had set, the stones were brushed with a stiff wire brush and the face of the concrete was brushed with a paint brush dipped in a "soupy" mixture of cement and water. The base of the figure was then built up in three sections in the same manner. The result was a very rustic piece of work, which attracted favorable comment.

The "cement stump" job, which was the result of another experiment, has proven not only feasible but very

THE TREE STUMP FERNERY.

THE FOUNTAIN.

practical. A large tree was cut down in one part of the school grounds. It was originally planned to pull up the stump but the writer asked that he might use the stump as the base of a rustic fernery. After obtaining permission, the first step was to cover the stump with a generous coating of sixteen-penny spikes, driven into the wood in such a manner that they projected about one and one-half inches. A small amount of earth was excavated about the stump base and into this was poured a fairly dry mixture of concrete to a thickness of about three and one-half to four inches.

As the work progressed, there appeared a slight tendency of the concrete to settle. To overcome this difficulty, an old horse blanket was slightly dampened and fastened about the stump. Stones of uniform shape, about egg size, were inserted in the upper part. The entire task took about six hours. At the end of that time, the blanket was removed and lines simulating bark and roots were traced on the surface. The marking was accomplished with the aid of a spoon-shaped stick, and the result proved very practical.

The bowl of the fernery possessed a drainage hole. The interior was shaped by means of a piece of sheet iron, bent in elliptical form. This piece of iron was inserted into the concrete which had been built up, to about 2½" above the top of the stump. The form tapered at the bottom to prevent damage through the accumulation and freezing of water in winter. The finished work proved very much worth while.

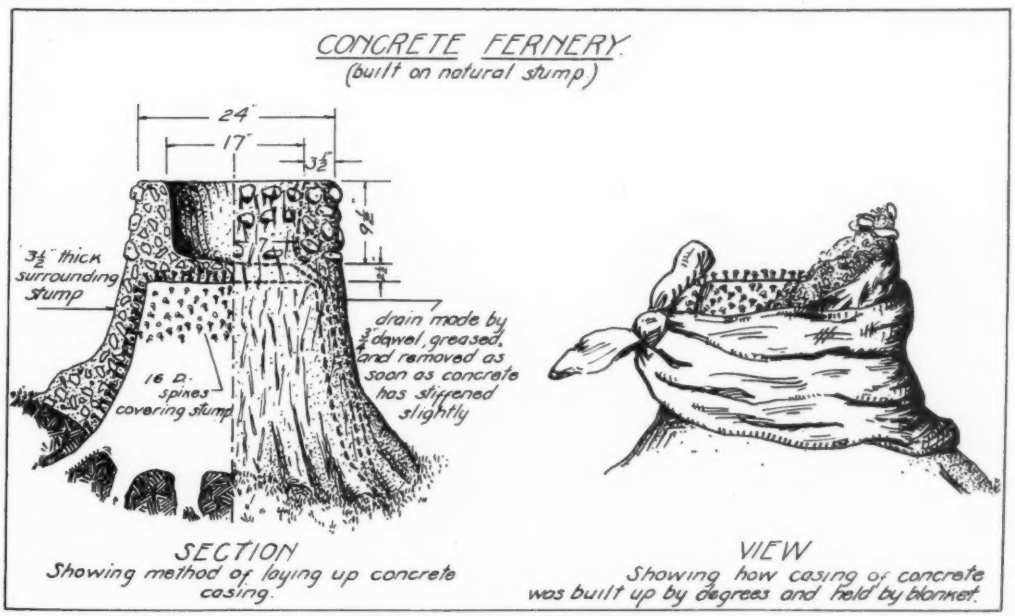
In preparation for casting the concrete steps, the ground was roughly hewn out in the form of rough steps, as shown in the drawing. Wood forms were then cut conforming to the size of the desired steps and carefully oiled on the inside to prevent sticking. Raw linseed oil was used for this purpose. The forms were then securely held in place to prevent bulging after the concrete was placed. Nails were not driven entirely into the forms but were merely toe-nailed to make their removal easily possible. After the forms were satisfactorily placed, gravel was wet and tamped firmly in as a sub-base. It is well to remember that a number of fairly good-sized stones, combined with the gravel, makes a good clinching material.

The concrete sub-base was next placed and thoroughly tamped. This was followed with the application of the top or finishing coat. The mixture was worked into every part of the form and roughly leveled up, even with the top of the steps. After the concrete had been placed about one-half hour, the top of the steps was smoothed to a fine finish with a trowel.

It is important to remember that the concrete should be in the form for about three hours, depending on the dampness of the mixture. After the concrete has set, the forms should be carefully removed, and all exposed surfaces neatly finished with the trowel. New concrete work should be amply protected from rain, heat or extreme cold by coverings of canvas, tar-paper, sand or straw. It should be dampened once or twice a day, for about a week, to insure even drying of the concrete.

As a result of many years' experience as an instructor, and the use of various commonly used mediums in shop work, the writer feels that concrete construction stands second to none in attracting and holding the interest of the average manual-arts student.

Gives Trade School to City. Supt. E. B. Sellew, of Middletown, Conn., recently paid a high compliment to Mrs. C. G. R. Vinal, who has given a trade school to the city. Mrs. Vinal's interest in the young people made it possible to have sewing, shopwork and singing in the schools. She provided the outfit and the instructors and has now made the trade school a possibility.


CONCRETE FERNERY
(built on natural stump)
24"
17"
3½"
9½"
5½"
3½" thick surrounding stump
drain made by ¾" dowel, greased, and removed as soon as concrete has stiffened slightly
16 D. spikes covering stump
SECTION
Showing method of laying up concrete casing.
VIEW
Showing how casing of concrete was built up by degrees and held by blanket.

DETAILS OF A TREE STUMP FERNERY.

The Mininum Equipment for an Auto-Mechanics Shop in High Schools

C. Arthur Clark, Fremont County Vocational High School, Lander, Wyo.

In selecting equipment for the high school auto-mechanics shop we should learn from the experiences of well-equipped shops doing commercial work at a profit. This has been the plan I have followed in selecting equipment for the Fremont County Vocational High School, and I have found by such a course that I have been able to secure the equipment at a minimum cost and yet maintain the efficiency of the shop. I am giving in this article a list of the equipment selected on this basis and I believe that such a list will be helpful to other schools thinking of introducing the subject of auto-mechanics.

My class consists of fifteen students in a full time apprentice course of two years, conducted under the Smith-Hughes act.

Shop and Machine Laboratory

1 Garage press large enough to receive a wheel
1 Roller jack for handling cars about shop.
1 Power emery-wheel stand.
2 Engine stands or heavy tables.
1 Universal axle stand, or heavy table with center cut out.
4 Bench vises, one a swivel base, one extra heavy and two medium.
1 Bench anvil.
1 Portable electric drill with valve-grinding attachment and bench stand.
1 Gasoline furnace.
2 Creepers for working under cars.
1 Two arm wheel puller.
1 Small gear puller three arm.

Wrenches

1 14″ pipe wrench.
1 18″ monkey wrench.
1 Set double end S-wrenches, openings ½″; $\frac{3}{16}$″; $\frac{5}{8}$″; $\frac{11}{16}$″; ¾″; $\frac{7}{8}$″.
1 Set double 15° double end solid wrenches, openings same.
15 15° double end solid wrenches, openings $\frac{5}{8}$″ and $\frac{5}{16}$″.
1 4″ adjustable end wrench.
1 6″ adjustable end wrench.
1 8″ adjustable end wrench.
1 10″ adjustable end wrench.
1 14″ adjustable end wrench.
1 each of the following speed wrenches:
NOTE—Numbers are taken from list of Walden-Worchester wrenches.
651-751-653-495-755-756-395-394-752-1018-1020-2716-2720-2418-392-762-5660.
3 each: 6016-6018-6020-6022-6024-1620.
1 set of Magneto wrenches.

Files

1 12″ bastard cut flat.
1 12″ bastard cut half-round.
1 10″ bastard cut round.
1 10″ bastard cut square.
1 10″ bastard cut three-cornered.
3 12″ finishing cut flat.
1 8″ finishing cut rat tail.
1 File for contact points.
1 File brush.
12 File handles.

Measuring and Precision Tools

1 6″ Machinist square.
1 12″ combination protractor and square.
1 6″ machinist scale.
1 thread gage.
2 thickness gage.
1 small caliper external.
1 large caliper internal.
1 large caliper external.
1 small caliper internal.
1 medium dividers.
1 internal micrometer with extensions.
1 1″ micrometer.
1 2″ micrometer.
1 3″ micrometer.
1 scriber.
1 medium-size surface gage.
1 universal connecting rod alignment jig.
2 sets of three bearing scrapers.

Chisels

1 cape large.
4 cape medium.
1 cape small.
2 cold chisels (chipping) large.
6 cold chisels (chipping) medium.
2 cold chisels (chipping) small.
1 round-nose medium.
1 round-nose small (oil groves).
1 diamond point medium.
6 center punches medium.
1 center punch small.
Drift pins $\frac{1}{8}$ to ¾ by 16th.
Drift pins extra long for bushings.

Other Small Hand Tools

Hammers and mallets.
1 straight pein 4 oz.
2 ball pein ½ lb.
2 ball pein 1 lb.
1 ball pein 2 lb.
1 sledge—12 lbs.
1 sledge—6 lbs.

Pliers

15 combination 6″.
1 combination 8″.
1 piston ring expander.
1 side cutting.
1 diagonal cutting.
1 piston ring compressor.
1 long nose or pick up.

Taps, Dies and Drills

1 set of S. A. E. taps and dies ¼″ to $\frac{5}{8}$″.
1 set of machine screw taps and dies 6 to 18.
1 set of adjustable reamers ½″ to $1\frac{1}{16}$″.
1 Ford spindle reamer.
3 Taper pin reamers No. 1, 2, 3.
1 set of twist drills $\frac{1}{16}$″ to ½″ by 64ths.

Screwdrivers

1 small for light connections.
15 6″ blade.
2 10″ blade.
1 12″ blade.
1 offset.
1 heavy T-handle large.
1 short blade light.
1 short blade heavy.

Miscellaneous Tools

1 large soldering cooper.
1 small soldering cooper.
1 hacksaw frame.
12 hacksaw blades 10″.
1 oil stone.
1 small hand drill.
1 pair tinner's snips.
1 pair medium heavy shears.
1 set carbon scrapers.
1 valve grinder.
2 valve lifters (different types).
1 set of steel figures $\frac{3}{16}$″.

Electric

1 Weston model 280 volt ammeter.
1 series test light 110 volt.
1 series test light 6 volt.
1 set of special wrench for starting or lighting machines.
1 growler used to test armature (AC) and charging magnet (DC).

Vulcanizing Tools and Stock

1 tire last or mandrel.
1 roller for canvas work.
3 fabric knife.
1 stitcher for working fabric and rubber.
1 quart vulcanizing cement.
1 lot of inner tube valve patches.
5 lbs. tread stock (vulcanizing rubber).
2 lbs. cushion stock.
2 lbs. inner tube repair stock.
1 lb. inner tube repair stock cured on one side.
5 lbs. carcass fabric.
1 lb. soapstone.

It will be noted that in the list given here the lathe, the acetylene welder, the regrinder, and blacksmithing tools have been omitted. This is for the reason that ninety per cent of commercial auto shops send the class of work done by these tools to shops making a specialty of such work. The kind of work done by these tools cannot be done at a profit, unless it is done in quantities, and it is bad business for the average shop to attempt to do it.

Ordinary vulcanizing will give the student the knowledge of rubber necessary to his handling a stock of tires; what repairing is done in the average shop can be done with the tools and equipment given above. Curing may be sent to a vulcanizer, or there may be added to the list above one cavity mold. Battery repair can be done more economically by sending it out.

There should be a separate room for instruction in car painting but a practical knowledge may be gained by using the regular shop as we are doing here. The only necessary equipment is a good sponge, two chamois skins, and two very good varnish brushes.

There is danger in equipping a shop of getting too much equipment. If the student has a full selection of tools and equipment for his training he will be at a loss when he goes into commercial work where such tools and equipment are not provided. It is best for him to get along with just as few tools and equipment as possible and then he will know what to do in any kind of a shop.

Day and Evening Industrial Classes. Day and evening industrial classes for adults were held during January and February at Winfield, Kans. The classes were arranged for citizens of the community and included poultry raising for day classes of farmers, and evening classes in city back-yard poultry work. This course was followed by three other agricultural classes, each for five days, including live-stock raising, marketing, and tractor demonstrating. Instructors from the Kansas State Agricultural College were in charge of the courses.

During February there were also offered day industrial courses in carpentry and gas engine work, in charge of members of the high school manual arts faculty. Three courses in salesmanship, show-card writing and ad writing were also offered for adults interested in these subjects.

PROBLEMS & PROJECTS

This department aims to present a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine shop practice, turning, pattern-making, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taboreta, towel holders, etc., which have been made from time immemorial, ad nauseum.

A SUGAR SCOOP

A Job Sheet for a Home Mechanics Problem in Sheet Metal

F. E. Tustison, Stout Institute

JOB SPECIFICATIONS: To make a sugar scoop from a tin can.

Many useful articles for the home can be made from tin cans. Cookie cutters, cups, and scoops are some of these utensils. In a book entitled, "Making Tin Can Toys," by Mr. Edward Thatcher, you will find description for the making of many toys as well as utensils. The use of the tin can shows what can be done by the energetic boy out of material that is ordinarily thrown away. Tin cans are also handy for the handling of paints and caring for brushes. Today we will make a sugar scoop.

FIG. I. TYPICAL TIN CAN.

MATERIAL: Tin cans, salamoniac, solder, paste.

TOOLS: Soldering copper, furnace, mallet, curved snips.

PROCEDURE:

(1) Select tin can.
Cans 3"—3½" in diameter make average sized scoops. The size of the scoop desired, however, determines the size of the can. It is best to save a can just as soon as it is opened. Wash it thoroughly and dry.

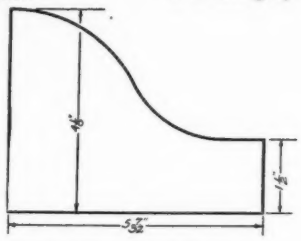


Fig. II—Folded Templet.

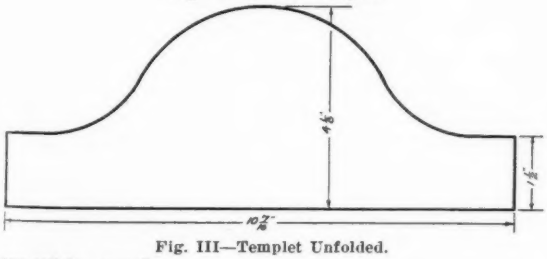


Fig. III—Templet Unfolded.

(2) Make templet.
Cut a piece of paper that will just cover the can. Remove paper and fold so that the fold runs with the length of the can. Draw the outline of the scoop desired on the folded piece. The above drawing will make a good shape. The dimensions apply to a can 3¼" in diameter and about 4½" long. Have your drawing checked at this point. When drawing is checked cut out with a pair of snips.

(3) Scribe outline on the can.
Place templet on the can so that the seam will be at the top of the scoop. Mark carefully with a scratch awl or pencil.

(4) Cut out to shape.
With the curved snips cut out to shape. Cut almost to the line with first cut and finish with the second cut. Take care not to leave any sharp projections of tin on the edge. Remove with snips or with the file if any do occur.

(5) Hem a handle.
The handle is made of stock about 1¼" wide. Break a ¼" hem on each side. If the can is long, the removed tin will be enough for this. New tin or tin from other cans can also be used.

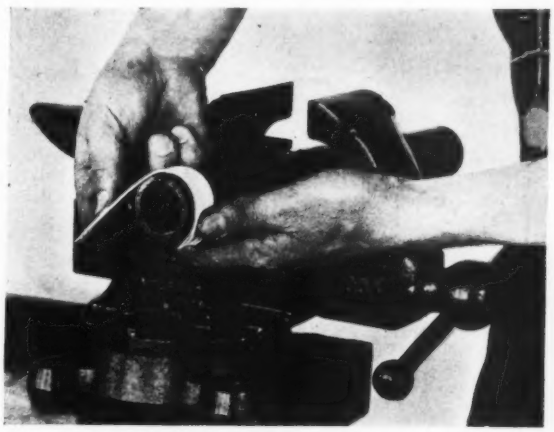


Fig. IV—Shaping Handle, Using Pipe as a Stake.

(6) Shape the handle.
Use a mallet or a piece of pipe as a stake. Bend the handle to the desired shape. Bend the hem out.

(7) Solder the handle.
(Remember you cannot solder unless the copper is thoroughly tinned.)
Place the handle in position and solder at the joint.

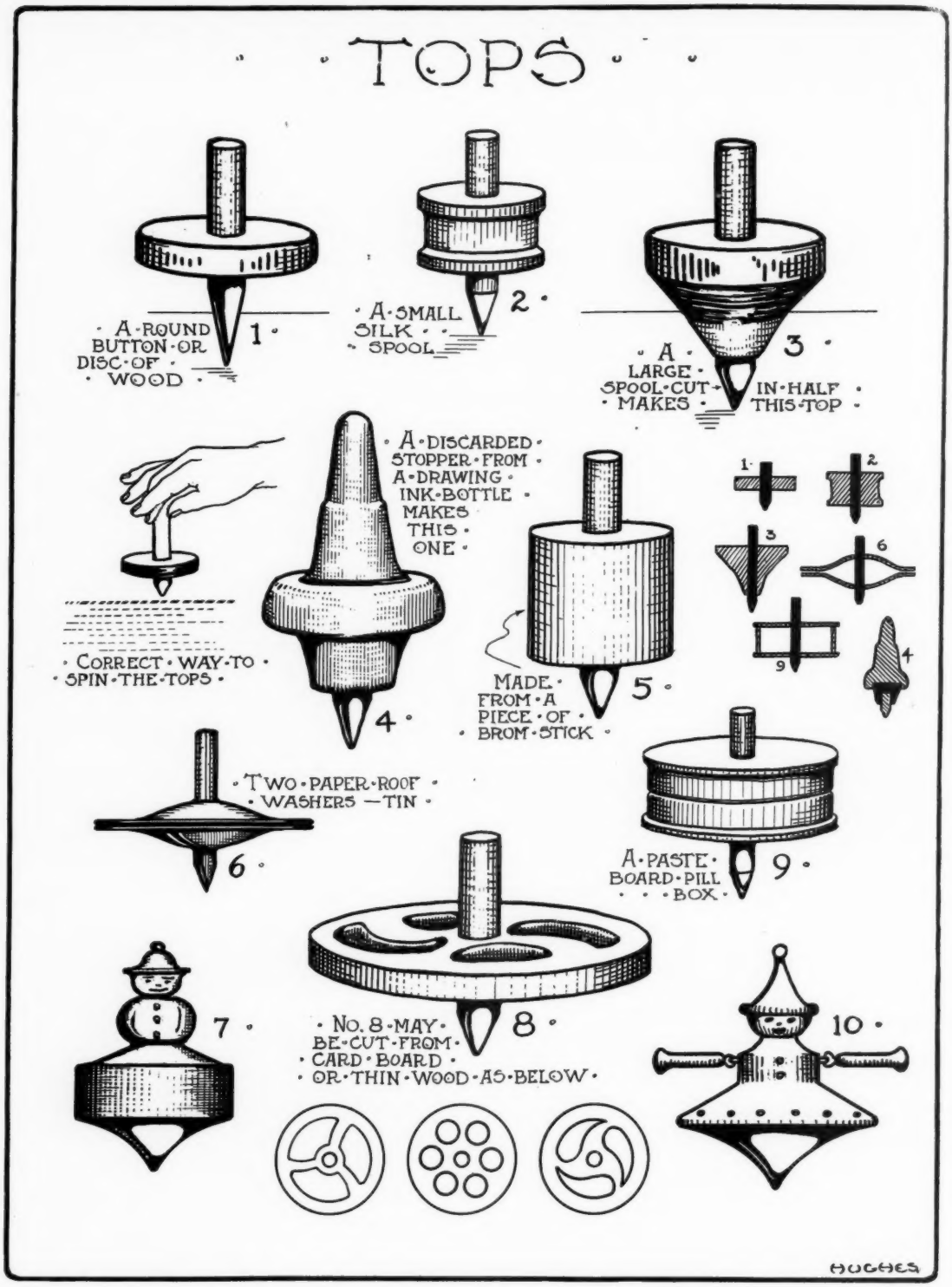
Fig. V—Scoop Made from Can 3¼" in Diameter.

QUESTIONS:

(1) Why make a templet?
(2) Why fold the paper before outline is sketched?
(3) What is the advantage of the curved snips?
(4) In saving tin cans why should they be washed immediately?
(5) Name two other articles that might be made from a can.

RECORD:

Name .....Class .....
Date begun.....Date finished.....
Have you answered all of the questions?.....
Instructor's Grade.....



TOPS

F. C. Hughes, Spokane, Wash.

One of the most interesting subjects, and one having many mechanical possibilities is the making of tops. Where is there a boy of any age who does not like to spin a top? He likes a top because it moves. He likes it because he can make it go.

All but two of the tops shown in the accompanying drawing may be made by very young boys with only a few odds and ends of material such as are usually found in the pocket.

In No. 1 we have a top that may be made with an iron washer, a button or a wooden button mold. The round disc on the end of the regular top string also works nicely.

Nos. 2 and 3—Spools of various sizes, shapes and kinds all make excellent small tops. In some cases the spools may be used just as they are as in No. 1, or whittled and shaped as in No. 3.

No. 4—Sometimes it happens that stoppers from some of the ink bottles make good tops; or a section cut from a broomstick or a curtain rod as in No. 5.

No. 6—The round tin washers used commonly on paper roof work, if used as shown, make well balanced tops.

In No. 9, the homely little pill box comes in for its share of the honors. In No. 8 there is shown a top that gives the boy some chance for design and originality, with some coping-saw work for good measure.

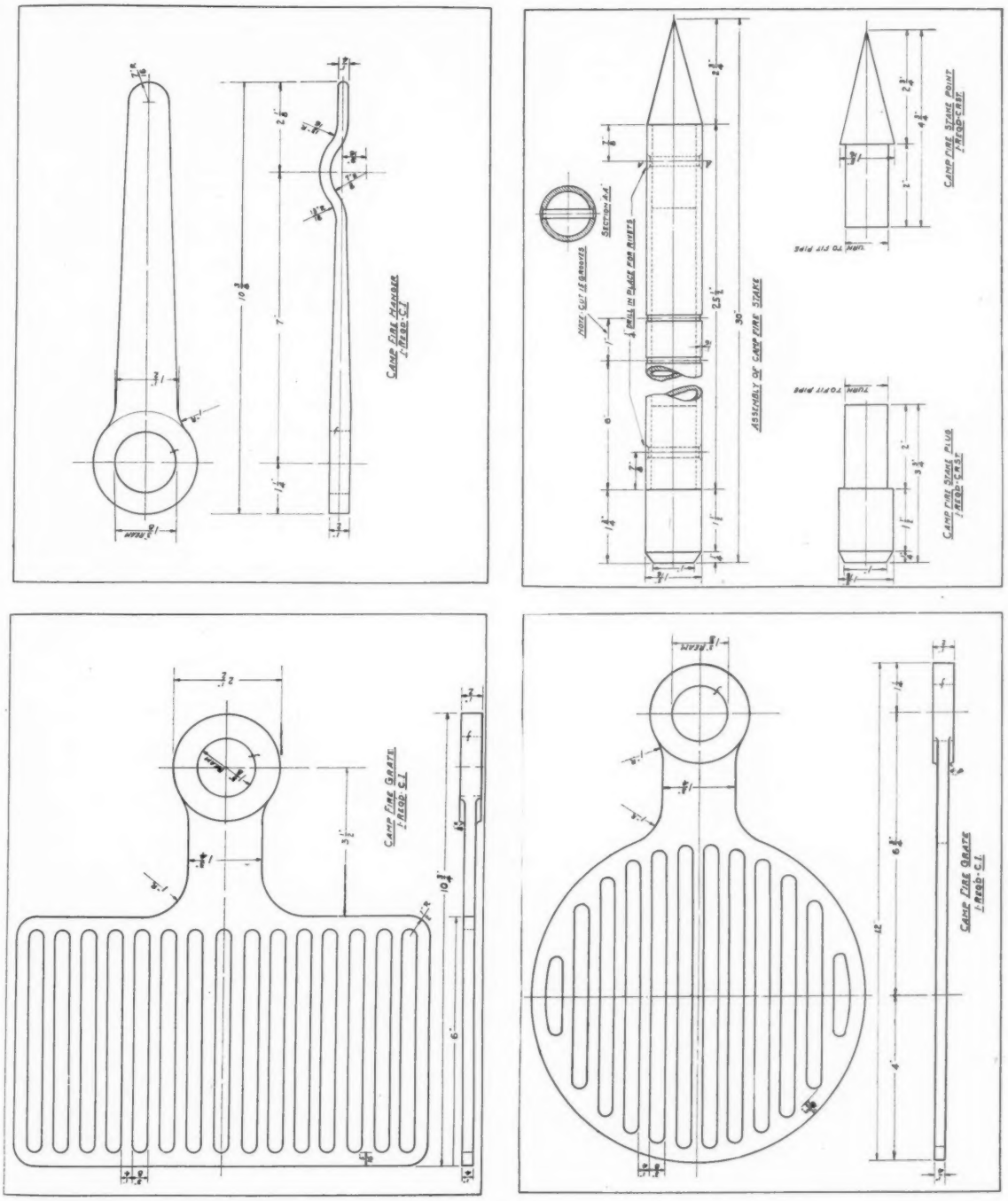
Nos. 7 and 10 will have to be turned on a turning lathe but make charming little toys when they are painted with bright colors and varnished to a glossy finish.

Of course, in each case the use of bright colors improves the appearance of any toy. In the case of the small top these colors may be so varied as to blend with each other when the top is set in motion, and thus teach the principle of color combinations.

CAMP-FIRE STAKE

C. H. Niemann, Vocational School, Racine, Wis.

The camp-fire stake was designed from a small picture which the writer found in Popular Mechanics. A



DETAILS OF CAMP FIRE GRATES, HANGER AND STAKE.

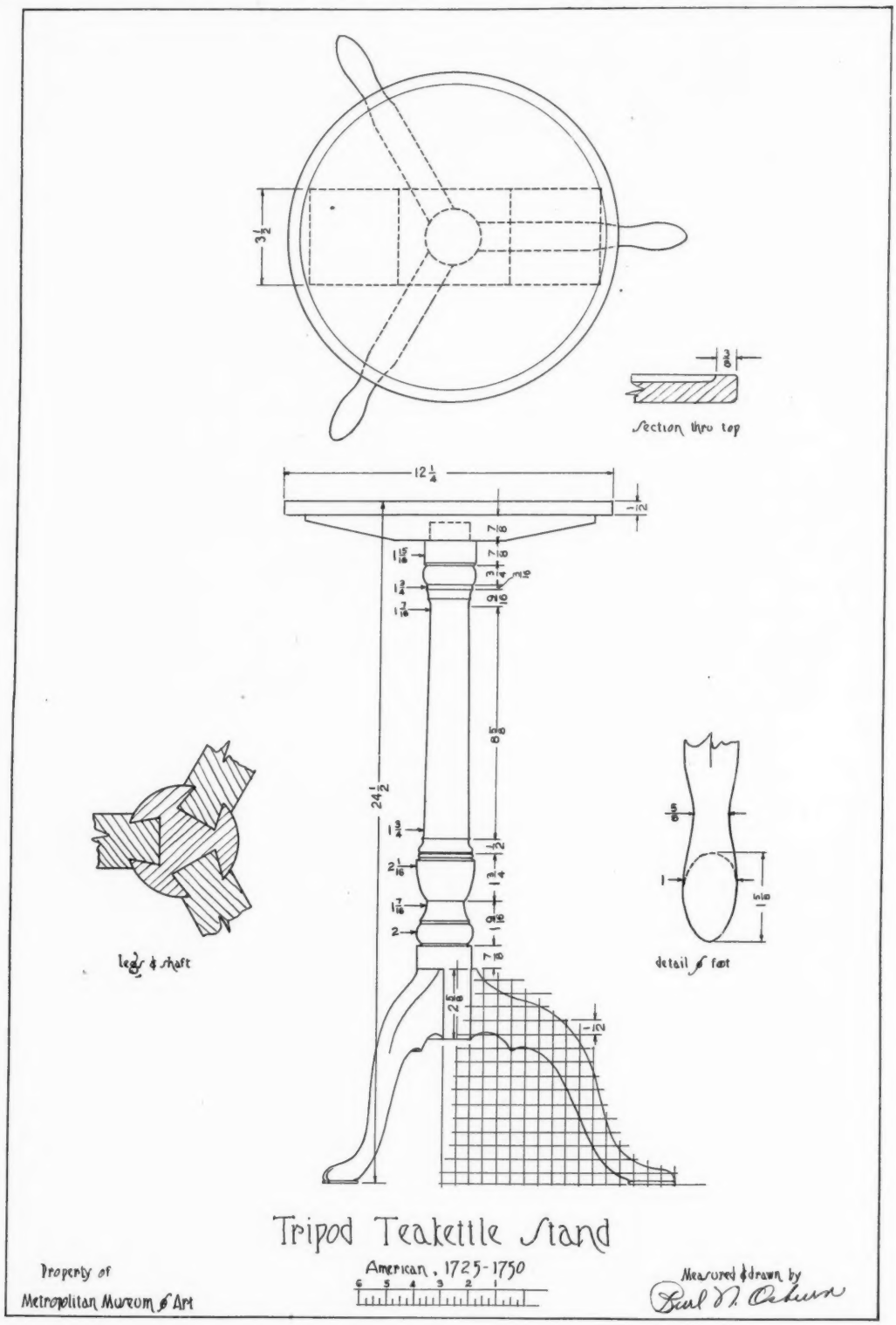
layout of the grates and hanger was first made in order to determine the proper widths and thicknesses, also size of pipe and distance from center of stake to center of grates. From this information the detail drawings were made.

This project has created considerable interest in the drafting room, pattern and machine shops, and the school is planning on making a number of these outfits to be sold on a commercial basis.

TEA-KETTLE STAND

B. N. Osburn, Sioux City, Ia.

When the fashionable habit, or art, of tea drinking came into such prominence, during the eighteenth century, it developed a complete set of equipment incidental



TRIPOD TEAKETTLE STAND.

to its technique. Tea service was always ready for instant use and the housekeeper provided herself with several tables on which the tea was brewed over spirit lamps while the guests and hostess exchanged the latest gossip.

The tea-table shown here is made of maple, though other more valuable woods were used. The proportions are good, but the delicate shaping of the feet and legs both in profile and section make it especially fine.

The construction offers no difficult problem except for the joining of legs and shaft. Before removing the shaft from the lathe mark a circle on it 2⅝" from the lower end, then cut off the bottom while the work is turning. A paper template the size of the shaft should be made and the tenons carefully laid out. The exact shape of the mortises may be marked on the end of the shaft and the lines for their edges extended along the surface to the circle previously drawn. Dovetails on the legs should be laid out from the same pattern. If additional strength is needed, a copper plate may be cut to fit under the shaft, and fastened with a screw in each leg.

Mill Sizes

No.	Name	T	W	L
1	top	¾	12½	12½
1	cleat	⅞	3¾	10¾
1	shaft	2¼	2¼	24
3	legs	1½	7	14

CONCERNING DOORS

Louis M. Roehl, Ithaca, N. Y.

If a door binds at the top or bottom take the pins out of the loose pin butts with which doors are usually fastened, using a screw-driver or a screw-driver and hammer. Then place the door on edge and plane the end. If possible place the door in a corner to help hold it in an upright position.

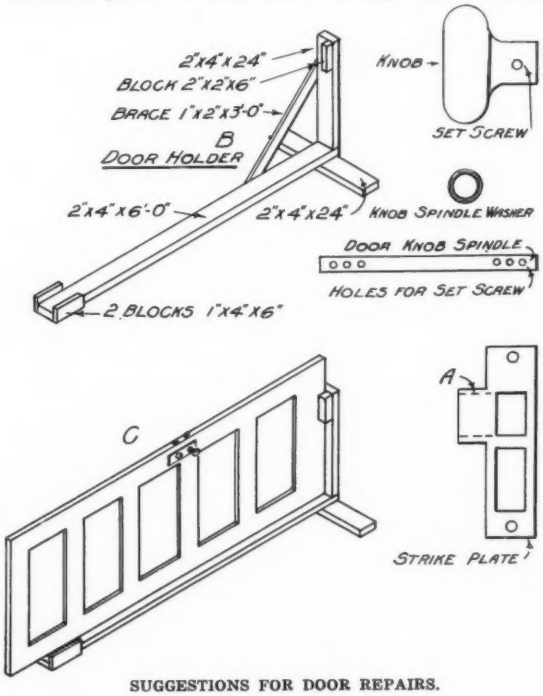
If the door does not catch when it is closed it may be because the door stop is too close to the opening in the strike plate. In that event the stop needs to be set back a short distance. It is usually so little that a stroke or two of a hammer is sufficient to drive it back the required distance. Since door stops are usually only half an inch thick it is difficult to drive them back with a hammer without marring the wood. A good way to prevent this is to hold a block of wood against the stop and striking the block. The workman should observe closely the location of the nails which hold the stop to the jamb and direct the blow at the nail.

Another reason for doors refusing to stay shut is that the building, or door, has sagged so that the keeper in the lock does not strike the hole in the strike plate. It may be noticed that the strike plate is mortised into the jamb and held in place with two screws. To tell just where the keeper hits the strike plate, draw a line with a soft pencil on the plate at the top and bottom edges of the opening out to the edge, as shown at "A" in the drawing, then close the door and note if the keeper is above or below the line and how much. Take out the strike plate by removing the two screws and hold it in the vise, then file the opening at top or bottom as need be. A triangular file is best suited for the work. The plate should be held in the vise so that the place which is being filed is close to the jaw of the vise. If the metal is held in this way the file cuts better because there is the least vibration.

"B" in the drawing shows a single stand which carpenters find useful in fitting doors. Any scrap lumber is suitable. The cross 2"x4" prevents the door and frame from tipping to the right or left and the brace holds the short 2"x4" rigidly upright. A small block tacked to the inside of the post at the top prevents the door from tipping out of the frame at the front end, and the two small blocks at the other end of the frame hold the door in place. This is a handy device for holding a door in need of planing at the edge or on the ends. "C" shows a door in place in the frame.

Knobs of doors are held to the knob spindle with set screws through the stem of the knob into the spindle. These set screws often become loose and drop out and, of course, the knob slips off the spindle of the lock. It is a good thing to tighten the screws in the knobs of all the doors in the house frequently. A small screw driver is best suited for the work.

The doors generally used vary in thickness from 1⅛" to 1¾". There are usually three holes in the spindle of the door lock for the set screws. The knob is crowded onto the spindle as tight as it will go and the set screw placed in the proper one of the three holes. To make an even closer fit, one, two or more knob spindle-washers are stripped onto the spindle, as may be needed. If the bolt of the lock slips or draws slightly as the hand grips the knob, one or more washers need to be slipped onto the spindle. If, on the other hand, the spindle binds in the lock, as indicated when the knob turns hard, a washer needs to be taken from the spindle. It is desirable to have a few door-knob spindle-washers in the household tool kit.

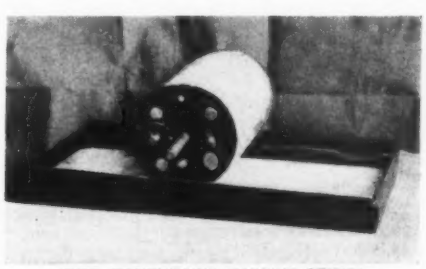


SUGGESTIONS FOR DOOR REPAIRS.

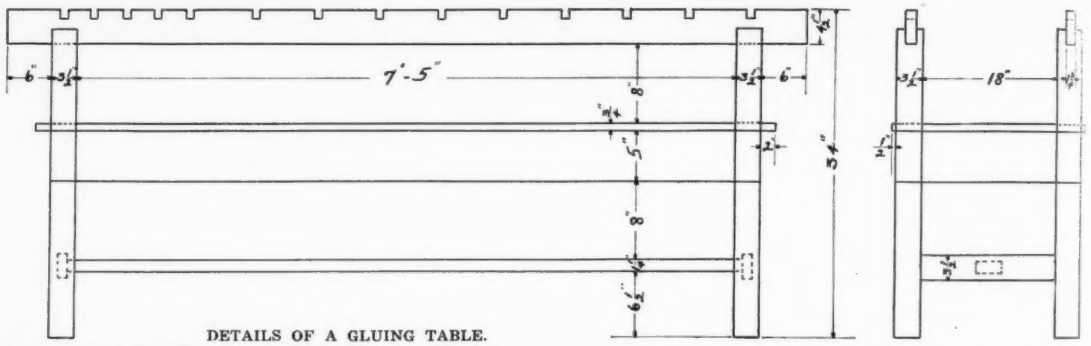
A "HOME MADE" GALLEY PRESS

J. W. Bollinger, East Junior High School, Sioux City, Ia.

The accompanying photograph shows a galley proof press made of materials from the wood shop, for use in the printing department. For some time a need had been felt for a more rapid way of making proofs of large copy, other than by means of the proof planer, especially when

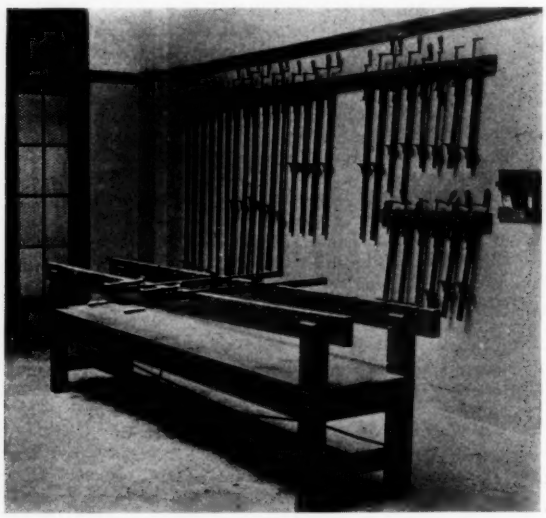


THE HOME-MADE GALLEY PRESS.



DETAILS OF A GLUING TABLE.

setting up materials for the school paper. In the absence of sufficient funds to purchase a manufactured galley press, the "home-made" one described below was made in the wood shop, and has been satisfactory.



THE GLUING TABLE READY FOR SERVICE.

The press has a marble slab 14"x30", which serves as the bed on which to place the galleys of type. The runway is of wood, so made as to place the roller ⅞" above the marble slab, in order to accommodate the type, the thickness of the galley, and the paper padding placed over the proof sheet. The padding acts as a cushion when the roller is passed over the type. The runway is made concave at the ends to prevent the roller from dropping to the floor. The roller was turned out of a solid block, and is nine inches in diameter and fourteen inches long. It is covered with canvas shellacked in place. Felt would have been a better covering for the roller but the price of felt was prohibitive. Two ¾" dowels serve as handles. Having the roller made of wood alone, however, was found unsatisfactory, because it was not heavy enough. To increase the weight, large holes were bored into each end and also radially along the length, and these were filled with melted lead. Tinfoil, babbitt metal, and lead piping supplied the metal. The roller weighs about twenty pounds and is satisfactory.

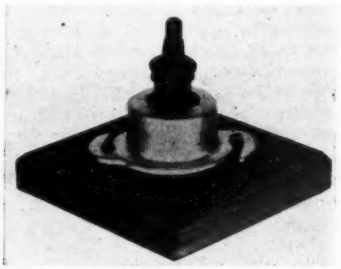
GLUING TABLE

D. K. Ingman, Coleraine, Minnesota

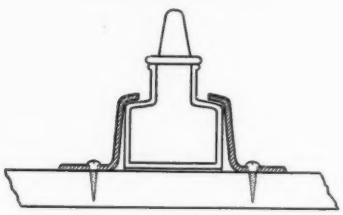
The gluing table has proven a great help in making good joints, because of the greater speed obtained by having clamps and materials properly placed.

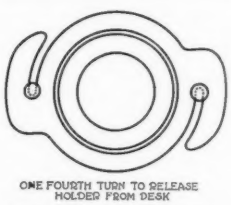
The notches in the top bars are cut to hold the style of bar clamps in use, and the "top" of the table is placed low enough to allow clearance for hand screws. The top, which is not fastened, may be removed for scraping off glue and paint droppings.

In case a special glue room is not available or large enough to warrant the use of such a table, a frame of two by fours similarly notched answers the purpose very well.



INKWELL HOLDER.





ONE FOURTH TURN TO RELEASE HOLDER FROM DESK

INK WELL HOLDER

By Geo. W. Dauth, Reading, Pa.

The ink well holder illustrated in the accompanying photograph and drawing can be made in any school as a shop project. The holder can be taken off the table by one quarter turn, but cannot be loosened or thrown down because the screws are set on a true radius.

WHAT IS YOUR OPINION?

A teacher writes the Editors: "What form should the shop teachers' (elementary manual training) preparation for the lesson take? Is the so-called plan book, as used by the academic teacher, practicable?"

For the best reply to these questions the Editors will mail a check of $10, on May 25. All answers should be limited to 500 words, and should reach the publication office at 129 Michigan St., Milwaukee, Wis., not later than May 15. A competent Educator will pass on the replies.

ITINERANT TEACHERS

To the Editor:

The second item in the editorial column of the current issue of the Industrial Arts Magazine attracts our attention. We do not understand it and are writing for an interpretation.

To our way of thinking there are cases in which the itinerant teacher of shop work is just what is needed. There are many rural schools of two, three or more teachers which have in attendance from one to a dozen boys from the farms who have never had and are not apt to have any training in shop work at the hands of the teachers in the schools. The teachers have never qualified for the work and also the local boards do not have sufficient funds to provide a person on full time who is qualified. Each school board of five or more communities may, however, have some funds for such work and it seems a very workable and sensible plan to have the several boards hire a man of sufficient shop training to give each of the schools a day once a week. By such a plan each school is paying what it is able to pay and getting a first rate man as often as his services work well into the school program. I am one of those who would like to see just that sort of teaching service made available to all the rural boys who do not have access to a high school where a man is employed on full time for teaching farm shop work.

It may be that the writer of the article had the same sort of thing in mind and I in my lack of understanding failed to get him, in that event he may be sure I am with him.

Sincerely yours,
L. M. Roehl.

Ithaca, New York, February 25, 1924.

WHO ARE THEY?

To the Editor:

In the Industrial Arts Magazine of March, 1924, page 124, under Sectional Meetings, the first eighteen lines, someone hits the nail square on the head. He has discovered some smoke, but he does not know where the fire is.

Some men, knowing where the fire is, might put it out, but most of the "old timers" will let it smother because it would mean a loss of prestige and perhaps their jobs.

We have too many well meaning pretenders in the ranks.

The teachers of agricultural and commercial education are at least honest with themselves.

There is an octopus at work strangling Vocational Education under the Smith-Hughes Act.

Are you interested or are you with the "old timers?"

Wm. T. Elzinga.

Mill Valley, Calif., Mar. 10, 1924.

REPORT OF THE 1924 NATIONAL VOCATIONAL GUIDANCE ASSOCIATION

The National Vocational Guidance Association at its annual meeting in Chicago, February 21, 22 and 23, fully demonstrated that vocational guidance is no longer a salvage corps, but a "going" concern. Different aspects of vocational guidance were given by psychologists, psychiatrists, statisticians, research workers, personnel workers, employment agencies, counsellors in public schools, colleges, and universities, placement officers, vocational guidance, directors, school principals, college presidents, and child welfare workers.

The first day of the meeting was general observation day. Miss Anne Davis, director of vocational guidance in the Chicago schools, kindly turned her offices over to members of the association. Docents conducted groups of fours through every division, where the head of each department explained her particular part in the scheme of vocational guidance. After such a splendid day as this, discussion was rife at the evening round table conference, presided over by Dr. Harry Kitson. Dr. John W. Brewer, director of the bureau of vocational guidance, Harvard University, representing training courses for vocational counsellors and directors. opened the discussion. He was followed by Dr. Mary H. S. Hays, director of vocational service for juniors, New York, who represented employing agencies.

The general luncheon, which is held on the second day of the meeting, had to be divided into five groups on account of the rapid growth of the association. Divisions were made up of those interested in (1) High School Guidance, (2) Placement, (3) Occupational Research, (4) Psychology, (5) Personnel Work in Colleges.

Friday and Saturday were given over to the different aspects of vocational guidance. Industry was represented by (1) Bryce M. Stewart, director of employment, Amalgamated Clothing Workers of America, who spoke on "Guidance and Placement in the Clothing Industry," (2) J. J. Garvey, educational director of the Western Electric Company, (3) S. Sheldon, educational director of the Donnelly Printing Company.

Dr. Smiley Blantan, University of Wisconsin, and Dr. Harry Kitson, Indiana University, gave the psychological aspects other than tests and measurements. The tests and measurement side of the problem was discussed by Dr. Frank N. Freeman, University of Chicago, and Dr. Mary H. S. Hayes, director of vocational service for juniors, New York.

Dr. C. S. Yoakum, director of the bureau of personnel research, Carnegie Institute, and Dr. L. J. O'Rourke, director of research, United States Civil Service Commission, argued the question from the angles of research and its bearing on vocational guidance.

Placement and follow-up, necessary steps in guidance, were discussed by Mary Stewart, director, junior division, United States Employment Service, while Mrs. Anna S. Burdick, federal agent for industrial education spoke on the importance of vocational guidance to vocational education.

Dr. Harry E. Mock, Chicago, gave an illuminating paper on the physiological aspects of vocational guidance. Present practices and proposals for vocational guidance in public schools, colleges, and universities were discussed, by (1) J. H. Beveridge, superintendent of schools, Omaha, who represented the public schools; (2) William M. Proctor, Leland Stanford, who represented the universities; (3) Dr. Iva L. Peters, Goucher, who represented the colleges.

The annual business meeting was held Saturday afternoon, at which the following officers were elected.

President, Edward Rynearson, Vocational Director, Pittsburgh.

1st Vice-President, William M. Proctor, Leland Stanford.

Secretary and Treasurer, Anne Davis, Director of Vocational Guidance, Chicago.

Trustees, Dr. Harry Kitson, University of Indiana; Beatrice Doerschuk, Bureau of Vocational Information, New York; J. H. Beveridge, Superintendent of Schools, Omaha; H. Dernback, South Bend; Dr. H. E. Mock, Chicago.

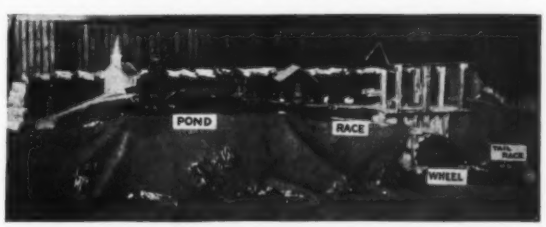
THE SCHOOL CRAFTS CLUB

The March Meeting

In response to requests from members of the School Crafts Club, two of the speakers at the March meeting talked upon the subject of wood finishing. The third speaker told us about some projects for metal work. This meeting was held in the Ethical Culture school, on March 15.

With Vice-President Frederick C. Arnold in the chair it was voted by the School Crafts Club to send its President, Mr. Edwin F. Judd of Montclair, N. J., to the Eastern Arts Association, which is held at Atlantic City, May 15, 16, and 17. The club will defray the expenses. The New Jersey Vocational Arts Association is to meet jointly with the Eastern Arts Association. Two new members were accepted: Mr. Hugh Speirs, Newark, N. J., and Mr. Arthur C. Hagenbruch, Passaic, N. J.

Mr. Arthur L. Perry, director of manual arts, Rahway, N. J., had for the subject of his talk, "Methods of Finishing Projects in Oak." Mr. Perry believes that this is a much deeper subject than many teachers give it credit for. There remains a great deal to be discovered as to methods and materials. Mr. Perry brought in a snatch of humor when he told a story about Pat falling from a high



A WORKING MODEL OF AN EARLY VIRGINIA SAW MILL. EXHIBIT OF THE SHOP DEPARTMENT OF THE EMERICH MANUAL TRAINING HIGH SCHOOL, INDIANAPOLIS, INDIANA. PAUL COVERT, SUPERVISOR.

structure. A fellow workman on a lower floor called out as he fell and asked him how he felt. Pat responded, "All right so far!" Many schools are spoiling projects by allowing a poor finish to be put on. Great care is exercised in the construction of furniture but the final result is poor because the finishing is hurried and not properly supervised. After the parts are cut out and the joints made, oak should be dressed down with a scraper and sanded with No. 2 sandpaper, before gluing up. The plane is undesirable in smoothing up oak, because this wood is so often crossgrained. When the glue is dry, Mr. Perry recommends another scraping, before raising the grain of the wood with a wet sponge. The latter will roughen up the surface and the fuzz must be removed with No. 00 sandpaper and plenty of elbow grease.

No furniture was exported from America until a few years ago. This was because the glue used would not stand up under climatic conditions abroad. Now a different story may be told because casein glue has solved the problem. This glue was developed during the war in aeroplane construction. It is said that this glue is made from sour milk but the process and materials used still remain a secret. Casein glue is prepared for using by beating the powder furnished by the manufacturer with certain proportions of water. The beater is called an emulsifier. The temperature of the water is not effective; but only enough glue for one day's use is mixed at a time, since the glue hardens overnight. In hardening this glue undergoes a chemical change which makes it impervious to heat and water.

The hardest part for the teacher is after the article is glued up. Then the boy wants to hurry the finish and get his furniture home. At this place in the process the teacher must be careful, and each job must be supervised individually. Mr. Perry has the boy do all finishing after school hours, when no hurrying is necessary to finish before the end of a period. When the wood is ready for staining, the remaining work is simple. Mr. Perry prefers the aniline stains for general use, such as those put out by DuPont and known as Bridgeport standard penetrating stains. Certain woods, however, require acid stains, but these are hard to use.

Mr. Paul C. Hoopes gave an interesting "Discussion and Demonstration of Rubbed Varnish Finish." Mr. Hoopes is director of manual arts in Roselle, N. J. Although wood fillers help to obtain an even, smooth surface, several coats of varnish are in themselves a good wood filler. Mr. Hoopes told of an experience he had had with Mexican mahogany. He found that the only effective stain was an acid stain manufactured by DuPont. In finishing mahogany the mahogany filler should follow the stain; but with oak either transparent filler may be followed by stain, or the stain may be followed by a colored filler. If penetrating stain is used, a coat of shellac must precede the application of varnish. Otherwise the varnish will not harden properly.

The proper use of varnish seems to have more don'ts than do's. There must not be any dirt around, no dust in the air, and the temperature of the room must be warm. He advises sprinkling the floor if possible with water to lay the dust. It is necessary that a teacher have the confidence of the pupils. If Mr. Hoopes has any doubters he has them try out their idea on extra wood, not on the project to be finished.

Mr. Hoopes has his pupils apply three coats of rubbing varnish, with only a light sanding between, before the rubbing begins. He advises felt rubbing pads, such as may be obtained from the American Felt Co., New York City. Other materials used are No. ½-0 pumice stone, FF rotten stone and lemon oil. Lemon oil may be used for polishing afterwards as well as during the rubbing process. The third coat of varnish is rubbed with pumice stone, and the fourth and last coat with rotten stone. It is well to fasten the felt pad to a block of wood with shellac. A period of four weeks should be allowed for the finishing process.

Mr. John M. Dockstader told the club about some "Safety Patrol Devices" which make good projects in metal work. Mr. Dockstader is director of manual arts in Perth Amboy, N. J. A traffic sign reading "Go" and "Stop" may be used by the boys on safety patrol duty to good advantage. Mr. Dockstader exhibited one of these signs in which the frame was of metal and wood, with a metal base filled with cement. Arm badges may also be made in the school shop. Mr. Dockstader had a tracing made of the design used and photo prints were made from this. Then a backing of zinc with a covering of thin celluloid followed. The celluloid was waste obtained from a dealer who repaired automobile tops. A wire strap holder should be soldered on the back.

CHIPPENDALE MAHOGANY DRESSING-TABLE FROM ESTATE OF GEORGE R. CURWEN.

See article by Burl N. Osburn in Magazine for March, Pages 119-120.

Wheels for carts bring in a good project for brazing. Two sizes are made, eight and twelve inch diameters. For the small size, the rim is made from a band of steel ¼"x¾"x24". The spokes are made from 20d. nails and the hub is built up with large sized ½" iron pipe within 2" iron pipe.

Mr. Edwin F. Judd added his bit by telling of the precaution used commercially where a rubbed finish is applied to furniture. The room often has walls, ceiling and floors covered with cloth which may be sprinkled with water for several days before varnishing is attempted in order to make sure that all dust is laid. Mr. Judd has found that machine oil is better than boiled oil in making a French polish on manual training projects.—**L. F. Stair.**

FINAL PREPARATIONS BEING MADE

For the Western Arts at Dayton

The final touches are being put on the preparations for the thirtieth Annual Convention of the Western Arts Association, to be held at Dayton, May 6 to 9 inclusive.

The new Roosevelt High School at Dayton is being rapidly completed and it is likely that the Dayton meetings of the Western Arts Association will be held in the beautiful auditorium of this building. If this is done the exhibits including the commercial and educational sections will be held in the gymnasium which is immediately opposite the auditorium and has an unobstructed floor space of ninety by eighty feet. The Roosevelt High School is but ten minutes from the heart of the city and is provided with excellent street car service, bus service and cafeteria service. Ample rooms are available for the round-table discussions.

The Tuesday and Wednesday evening program of the convention will be held in a convention hall in the heart of the city, and the banquet will take place at the Miami Hotel. Supt. P. C. Stetson of Dayton and Supt. Wm. McAndrew of Chicago will be the principal banquet speakers.

In addition to the program announced in the last issue of the INDUSTRIAL-ARTS MAGAZINE Mr. Vogel has made public the following round tables:

Art Round Table

Miss Florence Williams, Chairman.

Art Appreciation by Expression—Otto Ege, Cleveland School of Art.

Training Appreciation in the Community—Mrs. M. F. Johnston, Woman's Art Club, Richmond, Indiana.

Discussions—

Demonstration Lesson in Paper Construction for the Elementary Children—Miss Zimmer, Cleveland Teachers' College.

Report on Measurement of Achievement in Drawing—Miss Carey.

Report of Committee on Teacher Training and College Credits—Miss Mary A. Scovel, Chicago Art Institute.

Home Economics Round Table

Chairman, Miss Enid Lunn, State Supervisor of Home Economics for Ohio.

Art in Home Economics—Alice Robinson, Department of Art, Ohio State University. Discussion 15 minutes.

Teaching Clothing Design—Miss Amy Swisher, Miami University. Discussion 15 minutes.

Art Appreciation Courses as Background in Home Economics—Rossiter Howard, Curator Educational Work, Cleveland Museum.

Printers' Round Table

Leo Pritchard, Indianapolis, Chairman.

Art Possibilities—Henry G. Geilen, Chicago Normal College.

Subject to be announced—A. W. Jessen, Hughes High School, Cincinnati, Ohio.

Subject to be announced—Richard Dolecke, Fairmount Junior High School, Cleveland, Ohio.

Vocational Education Round Table

Chairman, A. B. Mays, University of Illinois.

Part-Time Apprenticeship Training, Howard L. Briggs, director of vocational education, Cleveland, O.

The Place of Foremanship Training in the Vocational Education Program, Prof. D. J. MacDonald, Ohio State University.

The Relation of Industrial Arts to the Vocational Industrial Education Program, Harry E. Wood, director of vocational education, Indianapolis, Ind.

NEW BOOKS.

Home Painting

A. H. Sabin. Cloth, 12 mo., 160 pages. Price, $1.50. John Wiley & Sons, New York.

This is the third edition of a deservedly popular book, written for amateur painters by an expert. The new edition has been improved by the addition of formulae and information to help the occasional painter mix his own paints and finishes. The book is dependable and sufficiently complete for the average man who desires to undertake ordinary painting and finishing jobs such as met with in the home, the store, and the commercial or industrial plant. Emphasis is laid on the correct selection of materials for specific types of work and the correct mixing and application of paints. The book will be found useful in every school shop where the elements of painting are taught.

Wood Working

By Charles G. Wheeler. Cloth, 369 pages. Illustrated. Published by G. P. Putnam's Sons, London, New York.

This book does not outline a course in woodworking but contents itself with a very concise, but comprehensive description of the tools and processes used by woodworkers, cabinet makers, carpenters, turners and pattern makers.

Pedagogic considerations have been given little attention by the author. The purpose is to produce a handbook to which anyone—boy, amateur craftsman, or experienced journeyman—may refer for a statement of correct usage and accepted practice. This purpose is splendidly achieved. Beginning with general shop equipment, the author takes up in detail each of the tools and describes and illustrates correct usage. A chapter on fundamental principles of construction is followed by details of all ordinary operations as applied to a wide variety of purposes. Two chapters on the use of machinery and wood close the volume. The illustrations are simple outlines and quite adequate.

Forging and Smithing

By Lynn C. Jones. Keratol, octavo, 211 pages. Price, $2. The Century Co., New York, N. Y.

While this book covers the broad field of forging and blacksmithing, it is essentially a textbook and will be welcomed in any type of school where forging is taught.

Parts one and two are devoted respectively to the shop and its equipment, and to shop methods and detailed processes of forging. Part three utilizes this background of trade principles and practices in a series of 21 practical problems intended to give the student or apprentice ample opportunity for applying all the tools and shop processes to situations which the blacksmith commonly meets. The jobs are well graded, and the tools, utilities, and repairs are of interest to the boy and of value for the school and home shop.

The farm application is kept clearly in mind and several of the problems are distinctly agricultural in purpose.

The appendix gives numerous tables of weights, sizes, etc., and provides much information which is usually scattered about in technical handbooks and is not available for the blacksmith.

The book is a worthy addition to the Century Vocational Series.

PUBLICATIONS RECEIVED

Standard Grading Specifications for Yard Lumber. By Edward P. Ivory, David G. White and Arthur T. Upson. Department Circular No. 296, October, 1923, U. S. Department of Agriculture, Washington, D. C. The information contained in this pamphlet was collected during four years of study of the problem by the Forest Products Laboratory. The pamphlet aims to put forth a clear picture of present practice in yard lumber grading and to present a set of standard specifications to serve as a guide for the lumber producing, distributing, and consuming interests in the effort to create American lumber standards. Among the topics treated are basis for standard sizes, shipping weight of lumber, grading rules, basic grades for yard lumber, specifications for molding, flooring, ceiling and partition, siding and common boards, shipping instructions, lumber definitions and abbreviations, and a summary of sizes for yard lumber.

FURNITURE DESIGNED AND MADE IN THE MANUAL ARTS DEPARTMENT OF THE MILWAUKEE STATE NORMAL SCHOOL. A. S. MADSEN, DIRECTOR.

Wearing Qualities of Shoe Leathers. By F. P. Veitch, R. W. Frey, and I. D. Clarke of the Bureau of Chemistry. Department Bulletin No. 1168, Sept. 5, 1923, U. S. Department of Agriculture, Washington, D. C. This pamphlet supplies the need for information on the wearing qualities of leather and on the effect of tannage, grease, loading materials and the kind of hide used, upon its serviceability and adaptability to the operations to which leather is subjected in the making of articles. The pamphlet discusses upper leathers, soling materials, toe wear of different types of shoes, burnt soles, effect of tannage, effect of acid tannage on the wear of sole leather, and the composition of original and worn sole leathers.

The Need of Art Training in College and Its Application in After Life. By George C. Nimmons. Higher Education Circular No. 27, October, 1923, U. S. Bureau of Education, Washington, D. C. The strongest appeal for art training in college is its great value as an educative study and its usefulness in after life. The teaching of drawing gives the student in college a training very valuable in many respects, and is a means of self-expression not acquired in any other way. In addition to the application of art training to the various callings and professions of the graduates from college, there remains its effect upon and connection with home life and the private and public career of each individual. The material contained in the pamphlet is the substance of an address delivered at a recent convention of the American Federation of Arts.

Bolt and Nut Chart. By C. L. Svensen, price $0.05, Milford Book Co., Milford, Connecticut. This chart affords a clever method for drawing United States standard bolts and nuts without the use of a scale. It will be found of especial assistance for teaching students how to accurately and quickly handle these drawings.

NOW ARE THERE ANY QUESTIONS?

Refinishing Bass Viol

Q. 454. I would like to ask your advice about refinishing a bass violin. The instrument has been fixed and glued leaving the finish in bad shape. Please advise me what kind of varnish to use and where I can get it. Also kind of stain—or doesn't that effect the sound qualities? If there are any other points in refinishing an instrument of this kind, I would be very pleased to know.

A. "I hesitate greatly to offer any working suggestions in regard to the refinishing of a bass viol by other than a trained instrument maker. The matter of proper gluing up of a check; the insertion of a wedging chip; the proper type of glue; the correct or incorrect amount of sanding—all these things and many others not easily recognized by trained men may so easily affect the value of the musical instrument. I have known of instruments worth considerable money to be absolutely ruined by the production of a beautiful finish, through the use of wrong varnishes which did not permit of the proper vibrations between the back and sound board of the instrument. Your correspondent does not mention even the type of wood entering into the instrument in spite of the fact that specifications for an instrument made of violin spruce would be absolutely useless on a combination of spruce sounding board with curly or bird's eye maple back as is frequently the case. Improper staining may even warp the sounding board out of shape so little as to be imperceptible and yet set up vibrations during use similar to those found in a public hall with a running echo. For these and other reasons I am suggesting that the instrument be shipped to the Clark Music Co., Syracuse, N. Y., who are reputable manufacturers of high grade instruments or to Lyons and Healey of Chicago, Ill., also famous for the quality of their products. If your correspondent desires a definite specification it must be distinctly understood that I will be in no wise responsible for the results."—Ralph G. Waring.

Spiral and Diagonal Grain in Wood

Q. 455. Why do trees grow twisted? Also why do some trees twist in one direction and some in others? I mean by that, that the fibers grow spirally around the tree causing the cross grain in wood when cut into boards. Can you explain the cause?—S. G. J. C.

A. The following discussion of spiral and diagonal grain in wood has been prepared by Mr. Arthur Koehler, Wood Technologist of the U. S. Forest Products Laboratory, Madison, Wisconsin, and is a portion of a forthcoming book by this noted expert:

"Spiral grain refers to trees in which the fibers take a spiral course giving the trunk a twisted appearance. The twist may be either right handed or left handed. Wood with pronounced spiral grain is not so strong, especially in bending, as straight grained material.

"Spiral grain can be detected most easily in sawed material by splitting the wood in a radial direction. The cleft will follow the grain and the split surfaces will be twisted. This, of course, mutilates the piece and is not always permissible. Spiral grain can also be detected on the flat-grain faces by the direction of checks, pores, resin ducts, and medullary rays, since all these extend parallel with the fibers. The direction in which ink spreads on the longitudinal surface of wood also indicates the direction of the grain. The presence, but not the exact slope of spiral grain can also be detected on the edge-grain faces by the inclination of the fibers pulled out by the planer.

"Comparatively short straight-grained pieces can be cut out of spiral-grained trees by cutting parallel with the fibers. Logs are sometimes split, or 'rived,' in order to obtain straight-grained material from them. This is done to some extent in making handles, staves, shakes, and airplane stock.

The slope of spiral grain varies considerably and may change with the age of the tree. In a tree inclined to be spirally grained, the slope usually increases from the center out, although exceptions occur. On some trees growing on exposed mountain sides the spiral has been found to run more nearly horizontally (like the thread of a screw) than vertically.

"The cause of spiral grain has never been satisfactorily explained. Some believe it is due to the influence of prevailing winds on lopsided crowns, causing the trees to twist. There are two objections to this theory. In the first place, the trees are not actually twisted—it would take a tremendous force to twist a tree, and mechanical failures probably would occur; furthermore, the center would show the greatest twist because it would have been longest under this influence, yet neither of the evidences of twisting is found. In the second place the spiral in some trees makes several complete revolutions, while if the above theory were correct the top would not twist more than 50 to 100 degrees from its original position. In spirally grained trees the fibers grow in an inclined position.

"Diagonal grain is produced when straight-grained timber is not cut parallel with the fibers. The objections to it are the same as for spiral grain. It occurs in careless sawing, in sawing crooked logs, and in the common practice of sawing tapering logs parallel with the center instead of parallel with the bark.

"If straight-grained timber is cut at a slant so that the grain slopes on the tangential faces of the stick, it has the superficial appearance of being spirally grained and should be classed as such. The only way to distinguish such slope of grain from true spiral grain is to split the piece radially. The split surfaces will be straight if the wood is cut from a straight-grained tree and twisted if cut from a spirally grained tree.

"If the timber is cut so that the grain slopes on the radial faces the direction of the grain usually shows up plainly because the annual layers of growth indicate the direction of the fibers. Diagonal grain of this kind may also be indicated on the tangential faces by the numerous parabolas formed by the annual rings. The direction and slope of diagonal grain can also be determined by splitting a piece of wood tangentially, but this is not necessary except in woods with very indistinct annual rings.

"To avoid confusion it may be well to repeat that spiral grain may be determined by the slope of the fibers on the tangential faces as indicated by checks, etc., and diagonal grain by the slope of the fibers on the radial faces as indicated by the annual growth layers. Of the two, spiral grain is more difficult to detect and therefore more often overlooked. Both spiral and diagonal grain are often called cross grain."

A further discussion of this same problem may be found in a special bulletin of the Forest Products Laboratory under the title "The 'Grain' of Wood with Special Reference to the Direction of the Fibres."

Dull Black and Gray Finishes

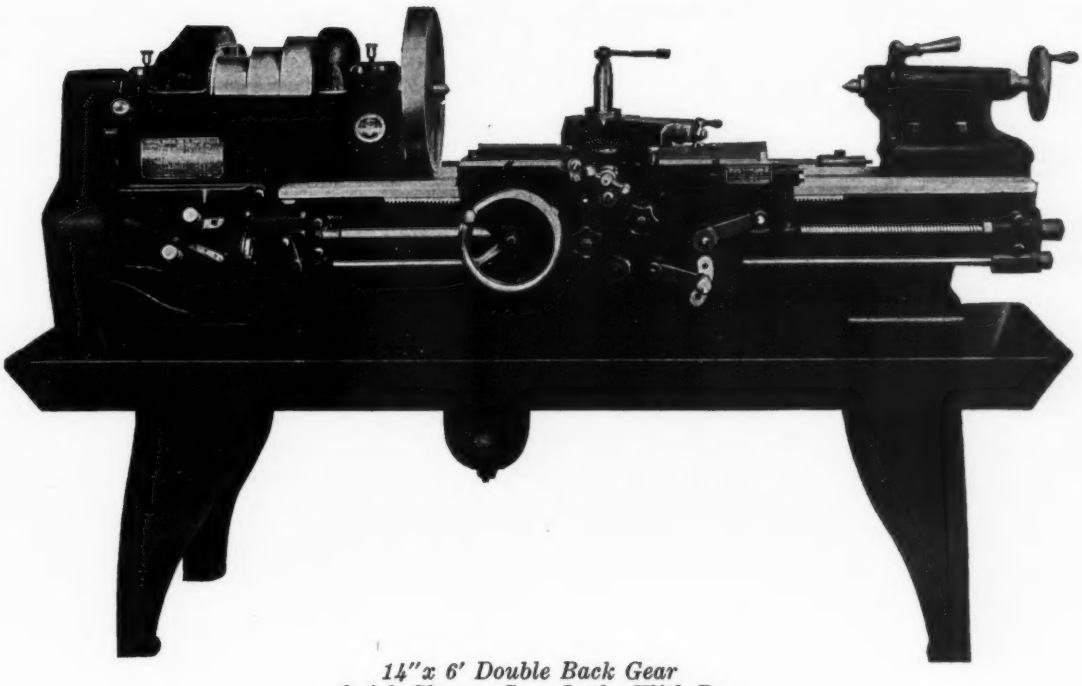
Q. 440. Please inform me what process and stain to use in finishing wood in dull black with pores of a light color or white giving a grayish effect?

A. Woods containing tannic acid need not be given sulphate treatment included in the following method. This would include oak, chestnut, most commonly used. Other woods such as basswood, poplar, birch, which are deficient in tannic acid need to be given a preliminary coat of one ounce of tannic acid per gallon of hot water. This should be allowed to dry, and any raised grain should then be sanded smooth with 00 paper. Second coat made from dissolving one ounce of sulphate of iron in hot water should follow. The material copperas sold in drug stores is adequate for this purpose. About one ounce of sulphuric acid per gallon of above solution will be of benefit. On exposure to the atmosphere over night this will develop a gray to black shade depending upon the concentration of the sulphate solution which may be increased or decreased as desired. Without sanding the dried wood should be given a thin coat of white shellac which when hard may be sanded smooth with split 6-0 paper. A second coat of diluted white shellac may then be applied, dried and sanded as before. A form of white or pale floor wax such as Old English should then be mixed with a small amount of zinc oxide ground in oil. This wax material should be rubbed on in such a manner as to thoroughly fill the pores and carefully rubbed to a polish before it is allowed to harden. One or more treatments is too contrasting; ordinary powdered rotten stone may be used with the wax instead of the zinc, thereby producing a different effect entirely.—R. G. Waring.

REFRIGERATOR PLANS

Q. 464. I have been trying to get a good working plan of a small refrigerator to suit an ordinary family. This is a fine combination of woodwork and sheet metal work and would be welcome in any school shop. Would you insert an inquiry in the "questions" column?—G. W. T.

A:—The Editor will appreciate any suggestions from readers to be published in the magazine, or to be forwarded to the inquiring shop teacher.



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TEACHING A TRADE BY CHAS. R. ALLEN'S METHOD

To the Editor:

In the November number of the Industrial-Arts Magazine there appears an article under the caption "A Comparison and Criticism of the Allen and Selvidge Methods of Teaching a Trade," by Prof. MacDonald. It is not my intention to offer any criticism, but I cannot quite make out what the author has accomplished in his hair-splitting article. He certainly gave us no information about how to teach a trade. Some people find it easier to be a critic than to be a "builder."

If we are looking forward soon for a complete textbook "How to Teach a Trade," then I see disappointment for my brother Scot (Mr. MacDonald) and many of us.

In the first place it takes a man who knows his trade to be able to teach that trade, and right here I expect to be disputed. The trouble with our present industrial training system is that too many "tinkerers" are trying to teach trades. They may be long on pedagogy but most of them are short on trade practice and experience. Recently, the writer saw one of those tinkerer-professors trying to teach saw filing. Each student looked up all the information in a book about filing a cross-cut saw. You would not care to see the results. Then the professor to prove his skill and cleverness proceeded to demonstrate how it should be done according to instructions given in the "book." No analysis of the job or trade information was offered.

I am taking the liberty here to point out some of the wonderful achievements in Teaching a Trade that have been accomplished by Prof. Chas. R. Allen in the past ten years and for which he has received too little credit.

Mr. Allen received the title of "The Skipper," affectionately conferred upon him by his many thousands of friends in the shipbuilding industry for his untiring and sincere efforts with the Emergency Fleet Corporation. "The Instructor, The Man, and The Job," was written about the time the United States entered the late war.

The Emergency Fleet Corporation was struggling and doing its utmost to build ships with the limited number of craftsmen then engaged in the shipbuilding industry. The apprenticeship system to train more men was tried out but this method proved too slow. It was then that a schoolmaster went before the Fleet Corporation and told this august body he could build their ships! Absurd, however, it did not take long for Prof. Allen to convince them that his ideas for teaching a trade were perfectly practical. Training departments were soon established in the shipbuilding centers and classes of skilled workmen representing some seventy odd distinct trades or crafts in the shipbuilding industry were receiving a course in trade and industrial teacher training to be better qualified to teach their respective trades to "green" men or learners. More than one thousand men were successfully trained as can be attested by the final results. Something like eight hundred thousand men were successfully taught to become skilled workmen in one branch of the trades, before the armistice was signed, and we can all recall that ships were launched within six weeks after the keel was laid, some achievement.

The success of this method of teaching a trade during the wartime emergency actuated the Federal Board for Vocational Education to establish trade and industrial teacher training courses under the direction of Prof. Allen within the terms of the Smith-Hughes Act in nearly every city and town throughout the United States wherever there were men and women engaged in some skilled trade or vocation.

In December, 1919, the undersigned was selected by the planing mills and building trades' associations to attend a course in trade and industrial teacher training under the personal supervision of Mr. Allen. "The Instructor, The Man, and The Job" was used as a textbook. Mr. Allen made it very definite that the text as written was intended to meet almost any emergency situation, where a trade was being taught, in the shops where all teaching conditions are the most favorable, or on a project, say building a frame house teaching carpentry. In the latter situation, jobs cannot be arranged in proper instructional order according to difficulty scale. Neither can the jobs in building a house be grouped into units or blocks, but must be taught in the order of sequence, during its progress of construction. An example, putting on the sill or wall plate on top of concrete masonry walls is one of the most particular operations or jobs and it comes first in the order of sequence. It must be level, square, parallel or difficulties will be encountered when setting up roofs.

(Concluded on Page XXVI)

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(Concluded from Page XXIV)

I have taught carpentry by the apprenticeship method ("now gone forever"), and have been teaching carpentry and cabinetry in the shop for ten years or more. Also taught carpentery, building houses during the summer terms of 1921-22-23 at the State Agricultural College, Colorado, and in my experience I can find little to criticize in the methods of teaching a trade as proposed by Mr. Allen.

True, he frankly informs his class that it could be boiled down, but I will repeat, the text was written to meet almost any emergency and it has not failed. In talking with Mr. Allen last summer he informed me that his second book on Foreman Training Courses issued by the Federal Board for Vocational Education was being criticized. He ventured the suggestion that common horse sense was being employed in the use of these textbooks. Too frequently this is true with any textbook.

GEORGE H. WILSON.
North Side High School, Denver, Colo.

ASSUMPTIONS IN TEACHING VISUAL ART.

The research department of the Los Angeles city schools has recently formulated a series of guiding principles for visual art instructions to be used by the teachers in the several high schools. As reproduced in the Research Bulletin, these assumptions read as follows:

In formulating pupil-experiences, one should always be guided by **general assumptions and principles**—the best that can be formulated—even though they be tentative working guides.

The assumptions here scheduled relate to the **general training**—not to the specialized vocational training. The latter must be taken up separately for each different vocation, and first by the specialists in the vocation itself.

1. All men and women of the city need a full understanding and appreciation of what constitutes beauty and ugliness in form and color in the things that make up their ever-changing environment.

2. Visual art training—for judgment and appreciation—should be **required** of all.

3. The first questions for the teachers of visual art and expression to answer with as great definiteness and completeness as practicable are: (1) What thinking, judging, deciding, etc., in terms of form and color should the men and women of this city (outside of their specialized vocations) be currently or occasionally **doing?** (2) What activities should they be performing that require the guidance of such thought?

4. Outside of vocational training, most art training will be for judgment and appreciation, not for skill.

5. For one's general purposes, the main thing is **to think** and **to judge** and **to enjoy**; not to create or produce art forms.

6. In this field, as in every other, one learns to judge by judging, to think by thinking, to apply general principles by applying general principles.

7. Except as art training is vocational its major purpose is **consumption**, not production.

8. Outside of certain vocations, and possibly also outside of certain simple geometrical and mechanical drawing, the majority of the men and women of the city have not enough need of practical drawing skill to warrant the necessary educational time and expense.

9. Opportunities will be offered students for short unit courses in constructive art which give that minimum of constructive art that is helpful to the understanding, and which gives an opportunity to talented ones to discover their possibilities.

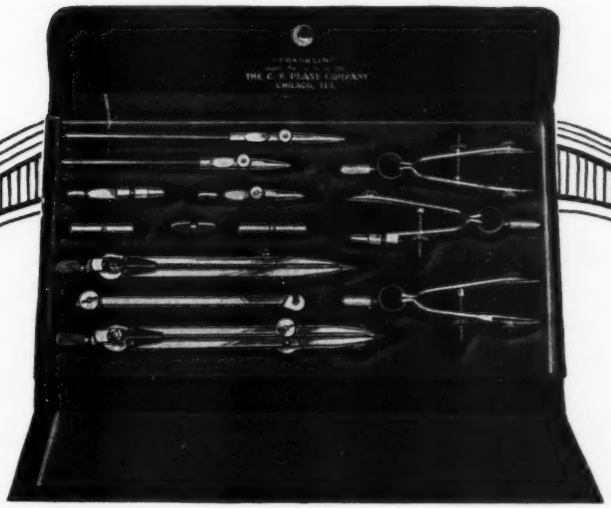
10. Except in the case of the talented ones, the fruits of much public school drawing are practically nil on the productive side and of relatively little value as training for consumption purposes.

11. Those who show no promise of skilful execution should be excused from the constructive side of the training as soon as this is discovered; and trained merely as "consumers."

12. There should be an abundance of concrete observation—studying things in the environment—analyzing them into their elements—judging them in terms of principles—making "visual art surveys" of many, many things.

13. There should be an abundance of fully illustrated reading which presents surveys of visual art possibilities in the various important fields.

(Concluded on Page XXIX)



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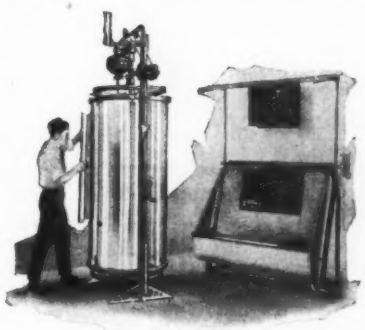

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(Concluded from Page XXVI)

14. A certain amount of constructive or creative art and design is necessary or advisable in developing powers of judgment and appreciation.

15. Classified sets of pictures of things to which principles of art have been applied should be used in making surveys of possibilities.

16. The ability to do form and color thinking and judging is to be developed in youth in ways and under conditions as nearly like those in which it will later function during adulthood as practicable.

17. The amount of geometrical and mechanical drawing needed by people in general, outside of their vocations, is so slight that for reasons of economy it should be cared for by the department of visual arts.

18. Mechanical drawing needed for vocational purposes should be directed by the vocational department to which the mechanical drawing applies.

19. For those who need skill in creative or constructive art in their vocations, the training should be intensive and thorough.

20. Training for skill in creative or constructive art has little or no place in the high school except as it is definitely vocational; and directed according to the needs of the particular vocation in which it is involved.

21. Amateur art work as a leisure occupation—except as it is a feature of unspecialized practical activities—has little or infrequent appeal and is not particularly fruitful.

22. Studies of art and design as applied to clothing, furniture, rugs, etc., should be directed in part by the home economics department and in part by the art department.

23. A similar division should be made in the case of commercial art, printing art, architectural art, etc.

ESSEX COUNTY ARTS ASSOCIATION

The Essex County Arts Association held a joint meeting with the State Department of Public Instruction on February 19, 1924, in the Hillside Junior High School of Montclair, New Jersey.

Mr. Frank G. Pickell, Superintendent of Schools in Montclair welcomed the art teachers of the county, and followed with a talk "Aspects of Good Teaching and the Relation the Art Teacher has to the Regular Course of Study." In his talk Mr. Pickell pointed out that along with other training, every girl should be taught the fundamental principles of good housekeeping. Mr. Otto Schantz, president of the association presided and gave a talk on the "Development of Truth and Honesty as an Aim for Manual Arts Work."

The "Industrial Arts" round table discussions were led by Mr. Campbell, state supervisor of Manual Arts.

Mr. Tuttle, supervisor of arts in East Orange gave a very vital and interesting talk, followed by C. A. Sawyer, of East Orange High. Some very fine samples of work were exhibited.

Omer Asher, supervisor of Orange, N. J., and Allen Backus, supervisor of Newark, gave well illustrated talks on "Mechanical Drawing as Related to Workable Problems."

The Drawing and Fine Arts group was led by Miss Della M. Hackett, teacher of fine arts, East Orange High School. Miss Bonnie Snow, editor of Art Publications, spoke on "Costume Design Made Interesting and Practical for Children of Junior and Senior High School Age."

Mr. Hugo B. Froehlich, director of manual and fine arts, Newark, N. J., was to have spoken on "Imaginative Design," but illness prevented him being present.

The Household Arts group was held in the kitchen and sewing rooms of the school where a complete suite of rooms has been newly arranged and furnished, consisting of kitchen, dining room, bed room and bath. Miss Youmans, of South Orange presided.

It was a banner meeting according to Mr. J. W. Cavileer, secretary and treasurer. Two hundred and twenty members were present. It so impressed one principal present that he expressed himself as wishing to see the time in the near future when all science would be taught in the shops and rooms of our art departments. "You teachers are the real science—teachers but under a different name" said he. Thanks were extended to Mr. C. H. Stafford for his cooperation in printing the fine program of the meeting.

CONFERENCE OF TRADE AND INDUSTRIAL TEACHERS

The annual meeting of the trade and industrial teachers of Oklahoma was held February 7-9, at Oklahoma City, in connection with the meeting of the Oklahoma Educational Association.

Dr. Charles W. Briles, state director of vocational education for Oklahoma, gave an interesting address on "The State Plan for Trade and Industrial Education." He called attention to the three sections making appropriations for the promotion of vocational education and the conditions upon which the funds thus appropriated may be expended. Dr. Briles suggested the following plan which will perhaps be made a part of the state plan: Establishing courses at the A. and M. College and University in (a) state and local supervision of vocational education;

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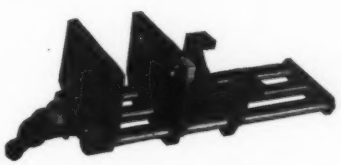

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(b) problems of teacher-training in trade and industrial education; (c) part-time education—objective, organization and supervision; (d) foremanship and instructor training; (e) evening school—functions, organization and supervision. These courses are to be operated during the school year and are not to be limited to summer sessions only. They are designed to meet the needs of an industrial arts group.

Dr. W. T. Bawden of Tulsa, gave two talks in which he defined "Vocational Education, Manual Arts, Industrial Arts, Manual Training and Practical Arts." "A program for education in the trades and industries," said Dr. Bawden, "must take into consideration the capacities and aptitudes of students. Previous preparation of the student and the kind of knowledge, the skill needed by workers in the various trades and industries, opportunities for employment, limitations and provisions laid down by industry itself." Dr. Bawden offered a comparative study of population and occupations in Oklahoma and he outlined a preliminary program whereby vocational education may be promoted in the state. Dr. Bawden's paper on "Supervision" proved most interesting and was greatly appreciated by the manual arts section.

Mr. Thomas H. Quigley, regional supervisor of trades and industries in the southern states, submitted the question: Are we headed in the right direction, or are we just making motions? Are we really making progress?

Dr. P. P. Claxton was the next speaker, taking for his subject, "The Relation of Vocational Education to Culture and Good Citizenship."

At the business session, the following officers were elected: President, A. H. Abbott, state supervisor of trades and industries, Oklahoma City; Secretary, Wm. S. Rosemond, vocational supervisor, Oklahoma City.

The manual arts instructors held a meeting on Friday, February 8th, with Mr. N. O. Horning of Tulsa presiding. This was the first meeting in several years attended by a full membership. The papers were well written and presented to the audince. The officers elected were:

President, Mr. H. F. Rusch, director of manual training, Oklahoma City; Secretary, Mr. Truman R. Lee, director of manual arts, Enid.

NEWS AND NOTES

Waterbury, Conn. A woodworking and domestic science room are being planned in the Maloney school, to be located in the basement. Bids for the addition will soon be advertised. All modern equipment will be installed when the rooms are completed. An addition is to be made the Bunker Hill school, consisting of a manual training room and a combined gymnasium and auditorium with two additional rooms for the grades. Specifications have been submitted for a proposed building for the Lakewood site. They call for a two-room structure either of frame or brick. The Lakewood site covers about an acre and is off in the rural section of Waterbury.

Trade Courses. The school board of Aurora, Ill., has adopted a program calling for the introduction of trade courses next fall. Under the plan, all boys in high school will be given an opportunity to learn a trade. Among the trades to be offered are building construction, concrete work, carpentry, plumbing, electric wiring, sheet metal work, plastering, painting and inside finishing.

Chemistry Prize Contest. The Committee on Prize Essays of the American Chemical Society, New York City, has announced the donation of several scholarships by various universities to be given as awards in the Society's prize essay contest now being conducted in high schools and secondary schools all over the United States. The scholarships are in addition to the six four-year tuition scholarships to Yale University and Vassar College given by Mr. and Mrs. F. P. Garvan of New York City. The University of Arizona offers two scholarships and remits all fees; the University of Iowa gives one scholarship; the University of Kentucky one and the University of Mississippi one. In South Dakota the Northern Normal and Industrial School at Aberdeen offers a prize of $25 for the best essay submitted in the state. In Texas the Baylor College for Women offers a scholarship to a prize winner worth $120, and the University of Texas also offers a tuition scholarship worth $120. The University of Utah gives one, and Washington and Lee University in Virginia is offering a tuition scholarship worth $80. The Catholic University of America has offered to give a four-year tuition scholarship worth $1,200.

In addition to the state awards, the prize winners will be entered in a national competition and the writer of the best essay on each of the six subjects will be given a four-year scholarship to Yale University or to Vassar College. Each of the scholarships will be accompanied by a cash award of $500 a year for the life of the scholarship.

The state committee in charge of the Wisconsin division of the prize essay contest is headed by Dr. J. H. Mathews, of the University of Wisconsin, and is composed of Prof. Arthur S. Loevenhart, University of Wisconsin, Madison; Dr. John L. Yates, Milwaukee; Judge M. B. Rosenberry, Madison; Mrs. John J. Blaine, Madison; Mr. John S. Donald, Madison; Mr. John Callahan, Madison; Mr. A. M. Brayton, Madison; and Maj. Gen. W. G. Haan, Milwaukee.

Art Conference Held in Western New York. A conference of art supervisors and instructors from Livingston, Monroe, Ontario, Yates and Wayne counties in the State of New York was held at the Memorial Art Gallery and City Normal Schools, Rochester, on March 7 and was attended by nearly 200 teachers. The meeting was called by Leon L. Winslow, State Supervisor of Art and Industrial Arts Education, who opened the meeting with a dis-

(Concluded on Page XXXIII)

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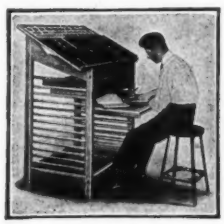

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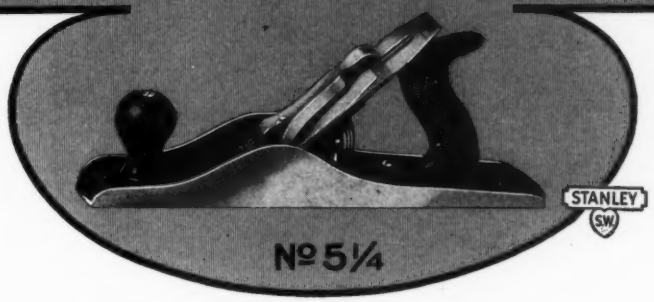

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(Concluded from Page XXX)

cussion of The Present Situation in Art Education. "Drawing is a tool," said Mr. Winslow. "Our ambition in teaching drawing should be to teach art, not abstractly but as it relates to problems in life outside of school, in the home and in the community, in commercial callings and in the industries."

William Betz, vice-principal of East High School, Rochester, gave an instructive address on Geometry and Art, and Lyonel Livingston, art instructor at the Madison Junior High School of Rochester, presented a paper on Commercial Art. The afternoon meeting was given over to demonstrations of the project method in art teaching by Sadie Farber, Alice M. Brown, Catherine Nichols, and Ethel Waters, all of Rochester, and Sarah Veeder of Lyons.

Officers for 1924-25 were elected as follows: President, Alice E. Yale of Brockport State Normal School; Vice-President, Lena O. Rogers of Geneseo State Normal School; Secretary-Treasurer, Gertrude E. Bolsford, Rochester Public Schools.

New Positions Created. The school board of Pittsburgh has created the positions of director of trade training and supervisor of industrial education, with Mr. F. W. Boland in charge of the former, and Mr. J. M. Speer in charge of the latter. The board has established a school year of twelve months for all trade schools.

Prisons Train for Trades. The principle of self-determination has been applied in the prisons of Pennsylvania in teaching convicts to be competent journeymen. Under the direction of Mr. James C. Tucker, general superintendent of industries of the Bureau of Restoration, Department of Welfare, a course of study has been outlined for trade classes. After the lessons are completed, the superintendent or foreman conducts the examination and reports the students' proficiency to the bureau, which in turn issues a certificate of competency. The plan has two objectives: first, to preserve the work habit, or to develop the habit where it does not exist; second, to train men to work in an industry so that they will leave the institutions as skilled workmen. The inmate carries with him when he leaves, a complete record of his proficiency in the particular trade. The Pennsylvania institutions manufacture shoes, brooms, brushes, textile products, garments and printed products, while the industrial reformatory manufactures vehicle license plates and conducts trade schools in a number of crafts and trades. The workers are paid a sliding scale of wages and they are permitted the use of one-fourth of the money while in prison, the remainder to be paid in installments upon release.

Evening Vocational Classes. The annual commencement exercises of the evening vocational schools of Albany, N. Y., were held on March 14th. The exercises marked the close of a most successful year for these classes. The popularity of the evening classes has increased from year to year, and this year it was shown not only in the large registration which exceeded 1200, but also in the increasing number of demands made upon the department by local trades and industries for the training of their workers. In response to such requests from organized labor and employers, classes for printers and brick-layers' apprentices were conducted at the Boys' Vocational School. The local automobile dealers' association also made a request for the training of their auto mechanics but lack of facilities made it impossible to comply.

Night School Exhibit. An exhibit of work done by pupils in the 1923-24 term of the Hudson Vocational Night School, at Hudson, N. Y., was held on March 7th and 8th. Included in the exhibit were mechanical drawings made in the drawing and drafting classes, millinery made by students in the millinery class, garments of all kinds, constructed in the dressmaking class, and samples of work done in the commercial department. The school reports an enrollment of 176 and an average attendance of 107 each night. The cost per lesson, per pupil, was estimated at thirteen cents, which is considered a very low cost for night school work. The school was in session for seventeen weeks with meetings three nights each week.

Home Making Project. The girls of the part-time classes at Hudson, N. Y., as a part of the home making work have undertaken the redecoration of the sewing room in the high school. The work involved the making of curtains, the refinishing of the furniture, and the collection of a variety of books on subjects pertaining to home making. The home nursing class has undertaken the making of sheets and pillow cases for the hospital bed. The girls also painted a chest of drawers and made a dresser scarf for a covering.

Pittsburgh Industrial Arts Association. The Pittsburgh Industrial Arts Association held its regular monthly meeting in the board of education rooms on March 27th.

Mr. J. D. Starke of the Junior Placement Bureau of the Pittsburgh Public Schools, addressed the meeting. His subject was "Placement and Vocational Guidance."

The annual spring meeting of the association will be held on April 26th in the Schenley High School. Dr. J. T. Morris, Dean of the School of Applied Industries, Carnegie Institute of Technology will be the speaker. He will speak on "The High School Curriculum in Industrial Arts Education."

The CATHEDRAL at Amiens, erected between 1220 and 1228, is perhaps the finest church of Gothic architecture in France.

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NEWS AND NOTES.

Vocational Exhibit. The twenty-eighth annual exhibit and closing exercises of the evening vocational school at Hoboken, N. J., was held on March 7th. The exhibit included sewing, embroidery, lamp shades, millinery, cooking, dressmaking, hairdressing and figure drawing. Certificates of proficiency were conferred upon ninety women who had completed the work of various branches.

Meat Market in School. A fully equipped meat market has been installed in the Milwaukee Vocational School, at Milwaukee, Wis. The market is a part of the retail store department established as a part of the school less than two years ago and has proven one of the most popular of the 52 courses offered. Meats used in the class demonstrations are cut according to regular standards by students, under the supervision of competent instructors, and are later served in the cafeteria of the school. Classes are held two nights each week and are in charge of experts in packing house practice and the operation of meat markets. Students are taught how to judge meat, how to grade it, meat cutting, accounting, salesmanship, and business management. The school has the approval of the local meat dealers and packing companies and members of meat packing firms frequently visit the school and give talks to the students.

Pennsylvania Sets Record. Vocational training in Pennsylvania schools during the last two years witnessed its greatest enrollment, according to a biennial report of the state vocational department for the two years ending July, 1923. The average attendance in these schools was about 60,000 and the cost of operating the schools for the biennium was $1,715,989, of which the federal government contributed $666,454. The report points out that during a period when vocational education in some states suffered curtailment, public opinion in Pennsylvania accepted vocational education as an essential part of the state program. An important aid to maintaining confidence is the practice of holding regional conferences on special phases of vocational education.

Southern Vocational School. Plans have been outlined for the establishment of a trade school at Dallas, Tex., to be known as the Dallas Vocational School. The aims of the school are to develop industries in the South by providing the necessary skilled workmen and to serve young men by opening to them a broader field of opportunity. The general supervision and control of the school will be vested in an advisory council composed of one hundred prominent citizens of Dallas and the southwest, to be appointed by the directors of the local chamber of commerce and to serve for life. The school will be financed by means of a half-million dollar fund to be subscribed by local citizens, and by a proposed endowment fund to be aided by men sufficiently able to endow the work. The school seeks to train boys as plasterers, brick-layers, molders, printers, plumbers, machinists and other skilled trades. The school will be entirely democratic in character and its control will be in the hands of the advisory council of one hundred citizens.

New Vocational School. A new vocational school will be erected on Grider Street, at Buffalo, N. Y.

Boys' School Reports Large Enrollment. The largest enrollment so far recorded at the Boys' Vocational School, Newark, N. J., was reported for the last term, with 580 pupils taking courses. Two of the departments reached their capacities, electricity and automobile repair, and a new course in foundry practice was installed with an enrollment of fourteen students.

An analysis of trades in each department has been made so that each step of the required training is listed and the courses are checked up to insure that every student obtains experience in every process in a three-year apprenticeship before completing a course in any of the trades.

Vocational School. A request for an appropriation of $200,000 for a vocational school and for permission to purchase a site, has been made to the city council by the board of industrial education at Green Bay, Wis. The plans provide for a building of the most modern design.

Boys' Trade School. Plans have been completed for the first vocational school for boys in New York City. The school will provide accommodations for 1,000 boys, will be four stories in height and will cost about $750,000. It will contain class and drawing rooms, science rooms, shops and other necessary rooms for trade training. Among the auxiliary features will be a cafeteria for pupils, lunchrooms and restrooms for teachers, a roof playground, a medical examiner's room, and auditorium seating 1,000 persons, a gymnasium with a capacity of 100, and an outdoor playground.

Vocational Conference. Seventy teachers of vocational training from every part of Passaic County, New Jersey, were present at the conference held on February 18th at Public School No. 2, Paterson, N. J., under the direction of Mr. W. A. O'Leary.

Supt. John R. Wilson welcomed the teachers to the conference and Commissioner O'Leary spoke on the Aspects of Good Teaching. At the round-table discussion on industrial arts, Mr. J. H. Constantine of Passaic, told of the aims and objectives for manual training in Passaic; Fred Tompson of Paterson, talked on "Projects for the Eighth Grade Shops" and Michael Greengrass discussed "The Place of Printing in the Grades."

Mrs. Iris P. O'Leary was chairman of the section on household arts, in which the teachers of the subject took part.

Tulsa Has Record Attendance. The Tulsa evening schools, with an enrollment of 2,257 students, have the largest group of students in night school classes of any city of the same size in the country, according to H. A. Abbott, secretary of the state vocational board of Oklahoma. The schools are meeting the

(Continued on Page XXXVI)

Reliefo– a practical medium for color relief work

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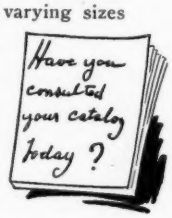

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WEBER
Cataloged Drawing Materials

(Continued from Page XXXIV)

needs of the geology and oil fields, the western union telegraph and other fields of service through the alternate week plan.

"Health Promotion in a Continuation School" is the title of a bulletin just issued by the Department of the Interior, of the U. S. Bureau of Education. The bulletin describes a school where parents and teachers work together for the good of the pupils, and where the children are educated beyond the narrow meaning of the term.

The Girls' Continuation School of Fall River, Mass., has been established in compliance with a law requiring children of school age in industry to attend school four hours each week. It also requires teachers to make provision whereby children may be enabled to comply with the law. The school has a capacity of 1,600 pupils and a daily attendance of 250. In addition to classrooms for academic work, the school also has rooms for home nursing, infant and child care, cooking and sewing, and home making. A small suite of rooms is reserved for the teaching of girls of the subnormal type.

In an essay contest treating "the cultured side of cabinet making in training boys," Miss Marjorie Mind, director of the manual arts department of the College of Industrial Arts, Denton, Texas, was awarded a $100 prize by the American Woodworking and Machinery Company of Rochester, New York. The contestants ran into several thousands.

Superintendent Johnson of Norwood, Ohio, has designated vocational training as "bread and butter" education. A local editor says that this phrase is a solar plexis punch in its favor.

Wisconsin Manual Arts Teachers Meet. The annual meeting of the Manual Arts Section of the Southern Wisconsin Teachers' Association was held February 15 and 16, at Madison, Wis. Mr. V. M. Russell of Platteville, acted as chairman of the meeting.

The meeting was one of the largest, if not the largest, of the meetings the association has held, about 1,500 teachers being present. The manual arts section had a large attendance for a sectional meeting, with fifty or more teachers of the manual arts in attendance.

Mr. W. E. Warner of the Wisconsin High School faculty, spoke on the subject "Organizing a School Shop for Training in Management." He emphasized the need of such a course because high school graduates often lack the necessary training to become minor managers. Prof. Ira S. Griffith of the University of Wisconsin, talked on "Educational Objectives." Prof. Griffith pointed out that education for service should have just as important a place in the schools as education for adaptability. Dr. B. E. Nelson of Stout Institute, talked on "The Influence of Vocational Education on Public School Policies."

A business session followed the reading of the papers by the several speakers. Mr. O. L. Dhien, of the East High School Faculty, was made chairman of the 1925 meeting.

Observe Twenty-First Birthday. The Kansas State Teachers' College, at Pittsburg, Kans., observed on April 3rd and 4th, the 21st anniversary of its establishment. The original name of the College was "The Kansas State Manual Training Normal School" and its purpose was the preparation of manual arts and domestic arts teachers. It had five persons on the faculty, an enrollment of 143 students, and only two departments. Instruction was carried on in temporary buildings. At present the College is divided into seventeen departments, with a total faculty of 114. The enrollment is 4,574. There are nine permanent buildings.

Pottery Department Enlarged. An addition has been provided for the pottery department at Wheeling, W. Va. Fine under-glazed and over-glazed tableware, vases and other pieces are now being made by the pupils.

Courses in Home Economics. Courses in home economics will be given under the provisions of the Smith-Hughes law at the Carnegie Institute of Technology, at Pittsburgh, Pa. The schedule includes sewing, millinery, cooking, nutrition, household management, and special methods in vocational home economics. In addition, a wide range of subjects will be offered teachers of fine and applied arts, manual and industrial arts. No tuition will be charged teachers for these subjects.

Buckley high school, Buckley, Washington, has completed a $60,000 building program this year covering the construction of a vocational building together with a four-room addition to the grade school. The vocational building, designed by Mr. V. W. Vorhees, Seattle architect, has six rooms for manual arts, three rooms for commercial subjects and two rooms for domestic science.

Vocational Evening Classes. More than forty vocational evening classes have been conducted in Kansas City, Kans., during the school season. Classes in flour milling, plumbing, building custodianship, brick-laying and interior decorating have been conducted for colored persons. There were large classes in the subjects of automobile mechanics, brick-laying, tailoring, interior decorating, cooking, millinery and dressmaking.

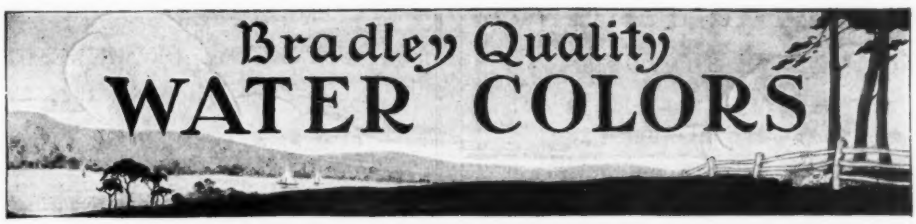
At Chanute, short unit courses have been conducted for carpenters and machinists. Fourteen large classes were organized for the women in cooking, dressmaking and millinery.

At Parsons, classes in home making subjects were formed.

The salesmanship class of the Wilby High School, at Waterbury, Conn., which began four years ago with practically all girls, is now composed almost wholly of young men. The students keep before them constantly the idea that they expect to devote themselves to the art of selling, and that in taking up salesmanship they are training for a life of service as well as preparing for a vocation in life.

Knoxville, Tenn., Opens Vocational Schools. On March 1, a room in a down-town school was opened as an "Opportunity School," where anybody of any age could enroll and get definite

(Continued on Page XXXVIII)



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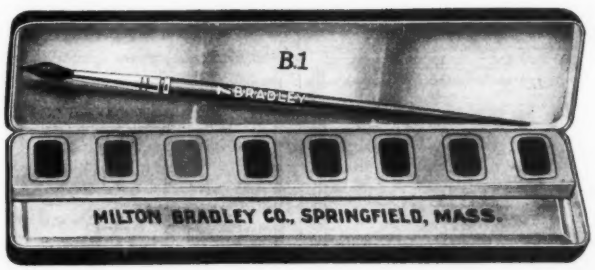

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First Term — June 16-July 19
Second Term—July 21-August 23

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The following departments will offer courses:

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Chemistry	**Mathematics**
Drafting	**Metalworking**
Economics	**Music**
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History	**Woodworking**

Summer Session credits may be applied toward certificate, A.B. or B.S. degrees.

Catalog and detailed information sent upon request.

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TWO TERMS — 1924.

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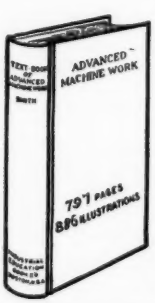

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- Part-Time School Home Economics Methods
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- Millwork I
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- Woodturning I
- Home Mechanics I
- Radio
- Carpentry I
- Patternmaking I
- Machine Shop I, II, III
- Foundry I
- Auto Mechanics II, III
- Drawing
  - Elements of Architectural Drawing I, II, III
  - Machine Drawing I, II, III
- Bricklaying and Concrete I
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- Swimming for Men
- Swimming for Women

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- Household Physics
- Clothing I, II, III, IV, V
  - I. Undergarment instruction, hygiene, and budget
  - II. Blouse and skirt, designing, personal accounts
  - III. Cotton and silk dresses, dress accessories, budget
  - IV. Wool and linen dresses, professional work
  - V. Advanced clothing construction
- Costume Design
- Millinery
- Food Economics
- Textiles
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- Foods I, II, III, IV, V
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  - III. a. Canning and preserving b. Fancy cookery
  - IV. Meal planning, preparation, and service
  - V. Experimental cookery
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For catalog address:
The Director of the Summer Session,
Carnegie Institute of Technology,
Schenley Park, Pittsburgh, Pa.

(Continued from Page XXXVI

instruction along needed lines. The limit of enrollment was reached the second day. Messenger boys, special delivery boys, clerks from local stores, etc., constitute the enrollment. It is expected that by another year the demands for this work will fill several more rooms.

A vocational night school was started in December. It meets two nights per week in the Central High School. The work is solely for employed persons and five-eighths of the expenditures come from the Smith-Hughes fund. The enrollment to date is 150. There are practically no foreigners in Knoxville, so that there is no need for language classes.

Steam Bending Wooden Objects. The U. S. Forest Products Laboratory, of Madison, Wis., has cooperated with the woodworking industries in a study of means for avoiding losses through breakage of steam-bent wooden objects. Red gum has been selected as the wood for the first experiments since this wood is the most extensively used for bending purposes and offers the most difficulty in the bending process. A hot plate bender made especially for the purpose, has been utilized in making the bending experiments.

Waterbury, Conn. The machine department of the Leavenworth high school has just added a duplex universal vertical miller and shaper and a gray planer with a six foot bed. This school has one of the best equipped manual training departments in the country and pupils who enter higher vocational schools or shops carry with them a solid foundation for a technical career.

Open Summer School. Miss Bonnie E. Snow and Mr. Hugo B. Froehlich have announced the organization of a Summer School in art education to be conducted in New York City during the months of July and August. Miss Snow and Mr. Froehlich formerly conducted the Industrial Arts Summer School for Laidlaw Brothers, and the new feature is entirely independent and is likely to be the nucleus of an all-year art school of normal and college grade.

Manual Arts Department. A manual arts department has been established in eight high schools at Fort Worth, Tex. There are twenty shops and eight drawing rooms in both the high school and grades in charge of a faculty of eighteen instructors.

The Vocational Education Bill. On March 10th, President

(Continued on Page XLI)

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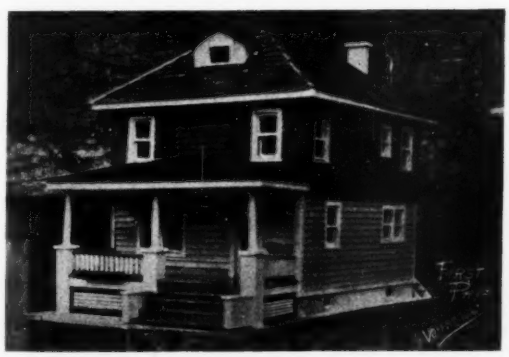

PRIZE HOUSE MADE BY STUDENTS OF THE W. IRVING HIGH SCHOOL, TARRYTOWN, N. Y. O. HAYFORD, INSTRUCTOR.

Coolidge signed a bill extending the provisions of the Vocational Education Law and of the Civilian Rehabilitation law to the Hawaiian Islands. The bill provides that the vocational work shall be administered under the provisions contained in the previous law signed by President Wilson in February, 1917. It authorizes additional appropriations guaranteeing the same minimum allotment provided for each state. The appropriations become effective for the fiscal year ending June 30, 1925.

First Prize for Model House. The boys of the Washington Irving High School at Tarrytown, N. Y., have won first prize for a model house constructed by the boys and exhibited at the annual convention of the Northeastern Retail Lumber Dealers' Association, held in February at New York City. Three prizes of $75, $50 and $25 were offered. In addition, three prizes of $25, $15 and $10 were offered for the best photographs of completed homes. The second prize in this contest was won by Hugo Von Schultes, also of the Irving High School.

The model house was complete in all details and was provided with miniature plant boxes on the porch and imitation grass. Boys in the grades carried out the preliminary work, while high school boys did the painting and finishing. The class in metal work did all the wiring for lights and the other metal work.

Humane Poster Competition. With a view of developing and fostering humane education, the American Humane Association of Albany, N. Y., has announced a prize poster contest open to boys and girls in the elementary and high school, and to art students and others not eligible to the other divisions. Prizes of $25, $15 and $10 will be offered. In addition, ten special prizes of $5 each have been offered, also a special $25 essay prize for the best essay on the subject of Be Kind to Animals Week. Essays must be not more than 800 words in length and must be received not later than May 31, 1924.

The Snow-Froehlich School of Industrial Art will hold its 1924 session in New York City, in the building owned and occupied by the famous New York School of Applied Design for Women, at 30th Street and Lexington Avenue. The session will begin on June 30th and close on August 8th.

The school will be under the direct management of Miss Snow and Mr. Froehlich, with Karl S. Bolander, Director of the Fort Wayne Art School, as Associate Director and Business Manager.

The Faculty will consist of Miss Snow, Mr. Froehlich, Mr. Bolander, Miss Grace Lee Knell (Director of Art in the schools of Ridgewood, N. J.); Mrs. Olga Ross Hannon (Head of the Department of Applied Art, State College, Bozeman, Montana); Miss Caroline Sheldon (Head of the Art Department, South Side High School, Newark, New Jersey), and Mrs. Emily Ford Russell (of the New York School of Fine and Applied Arts). Mr. Hayes Quinn, of the Fort Wayne Art School, will officiate as Social Director.

Miss Snow and Mr. Froehlich have for years conducted a summer school of Industrial Art in Chicago. They hope to establish a permanent, all-year school in New York City, independent of any commercial affiliation. To this end is launched the Summer School of 1924.

The transfer of the school from Chicago to New York is made because of the desire of all art teachers to reach their Mecca, and because New York has no other school where the practical training for which the Snow-Froehlich School is famous can be secured.

A conference of art teachers has been called by Jennie L. Clark, President of the Westchester Art Teachers' Association, to be held in the Metropolitan Museum of Art, New York City, on May 23, 1924. The teachers are asked to report to Classroom B promptly at 10:30 a. m. There will be three speakers and an opportunity will be offered for discussion of the topics presented.

Ernest W. Watson of Pratt Institute will give an illustrated address on Posters; J. Winthrop Andrews, Director of Art in the Yonkers Public Schools, will present Art in the Junior High School; Leon L. Winslow, Supervisor of Art Education of the

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THE FREDERICK POST

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CHICAGO, ILL.

Department, will explain The Manner of Accrediting Drawing and Art Subjects in High Schools.

Exhibitions of pupils' work to be on display are as follows: First Year Design Work of Pupils in the Mount Vernon High School; Representative Drawings from Seventh and Eighth Grade Pupils of Yonkers, and Advanced Applied Design Work of Pupils of the White Plains High School.

NEWS FOR THE BUYER

Open New Store. The Eugene Dietzgen Company have just announced the opening of a new store at 379 Broadway, Milwaukee, Wisconsin.

A School Printing Exhibit. The accompanying photograph represents an exhibit of printing arranged and installed by

THE SCHOOL PRINTING EXHIBIT OF BARNHART BROS. & SPINDLER AT THE N. E. A.

Barnhart Brothers & Spindler, at the recent convention of the National Education Association, held February 24th to 28th at the Congress Hotel, Chicago, Ill.

The exhibit which was perhaps the best which the firm has held, included pictures of equipment suitable for schools, samples of printing, and a few typical pieces of equipment of interest to those engaged in the work. A combination press and a backer used for book binding were among the articles on display. The large, paneled frames at either side of the booth contained school specimens of printing from various parts of the country, comprising the handiwork of students.

The exhibit was made doubly interesting and valuable through a display of rebound books and a variety of leather articles displayed by the book binding department of Colorado Teachers' College at Greeley. This exhibit was in charge of Prof. O. W. Schaefer, who has charge of this work at the College. He cheerfully explained to superintendents and others interested, the nature of the courses in book binding and leather craft work and the results obtained.

New Disston Marking System. To facilitate recognizing the several types of Disston saws and make stock-taking easy, Henry Disston & Sons, Inc., of Philadelphia, Pa., have announced the adoption of a new method of marking hand saws.

A label giving the style, size, point, appears on the horn of the handle where it is always in plain sight.

"This improvement in the method of marking was made for convenience," said Mr. S. Horace Disston, vice-president of the Disston firm.

"While it was not difficult to distinguish a 26" saw from a 24" saw, close inspection was necessary to tell an eight-point saw from a nine-point saw, to cite a common example. The new label does away with this need for such close examination, because the style, size and point are in plain sight on the handle-label."

PERSONAL NEWS

Mr. Laurence Parker, for the past year and a half connected with the Veterans' Bureau of Cincinnati, O., has become director of teacher training in the trades and industries of Kansas. Mr. Parker will be connected with the Kansas Teachers' College. A large part of the work will be of an itinerant character.

Miss Lillian Jacoby, formerly of Rockford, Ill., died on February 27th, at Boston, Mass, after an illness of more than a year. Miss Jacoby was a former art instructor at Rockford, and more recently had taught art in Boston. She was an alumnus of Rockford College.
be discussed.

Mr. C. A. Jay has recently been appointed president of the Dallas Vocational School, at Dallas, Tex. Mr. Jay began his new duties on March first, and one of his first tasks will be the consideration of plans for the building of the school. A total of half a million dollars has been subscribed by prominent businessmen of Dallas and the vicinity for the school. Mr. Jay was formerly vice-president and general manager of the Dallas Open Shop Association.